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DIET AND DISEASE IN CHILDHOOD.¹

By P. A. EARNSHAW, M.B., Ch.M. (Sydney).

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TONIGHT it is my intention merely to indicate how the newer knowledge of nutrition, gained by workers in laboratories, in hospitals and in outside practice, may be applied to the child. Such experiments as those of McCarrison at Coonoor in southern India, and their practical application to children by Pendred in a London crèche, lead one to believe (with Moncrieff) that the good results to be expected are not a matter for speculation, but rather of fact.

It is natural that I should begin at the commencement of life and deal with the infant. Sir Truby

King's slogan that "breast-fed is best fed" still stands 100% true as far as the infant is concerned. The contraindications apply only to the mother, and they are few.

Nevertheless even today one hears it all too commonly said, when a mother brings along her dyspeptic infant: "My doctor ordered me to take baby off the breast", when all that was needed was an adjustment in the manner of feeding. If a practitioner who gives such advice reflects for a moment, he must realize that the cow's milk, which is meant for its calf, cannot be better for a baby than its own mother's milk—or else all nature is wrong.

I know it is sometimes said that the baby's condition improves after it has been taken off the breast; but I maintain that in such a case investigation into the manner of feeding, the quantity taken, and the health of the mother and child would reveal the cause, and that this should be remedied. The progress, whatever it may be on unnatural feeding, would be at least as good, if not better,

¹ Read at a meeting of the Queensland Branch of the British Medical Association on November 1, 1935.

on natural feeding, and without the added risk to the baby, or discomfort, expense and extra work for the mother.

The greatest offenders in this respect are among the maternity nurses, especially those on the staffs of private maternity hospitals.

The time has arrived when it should be obligatory for every maternity nurse to hold a welfare certificate.

When natural feeding cannot be undertaken, a cow's milk mixture is the best substitute. In composition the mixture should approximate to breast milk as closely as possible, especially in the early months of life.

For infants up to two years of age the milk should be boiled.¹ In theory all milk should be boiled, for milk suffers little harm in boiling. Moncrieff has written thus:

Every available piece of evidence, with one exception, indicates that boiling the milk only destroys such constituents as can readily be supplied in other forms (vitamins), while it is actually beneficial as regards rendering protein more digestible and improving the absorption of certain of the minerals.

The taste of boiled milk is a disadvantage, but if children have had no other there is no difficulty.

The public generally has to be reminded that milk is food, not merely for the baby, but for adult and child. It should be a definite daily ration. Too often it is regarded merely as a vehicle for other foods.

Corry Mann has demonstrated that one pint of pasteurized milk daily has a surprising effect in growth and development; also the incidence of disease is lowered.

Sprawson has shown that dental caries is less when the children have a daily ration of raw milk. However, it is probable that boiled milk would give equally beneficial results. Unboiled milk has been recommended by some as a means of increasing immunity against tuberculosis, but there are better ways of doing this than by drinking infected milk.

There is no doubt that a pint a day is the optimum amount of milk which should be included in the diet of every person, whether adult or child.

Dried milk has its uses, for it is sterile and less easily contaminated. I therefore order it when the home surroundings are unhygienic. It is especially useful in the remote parts of our State, where fresh milk is not obtainable. Again, dried milk is more easily digested, which is an advantage in the case of a dyspeptic baby.

In prescribing a milk mixture, whether the milk is fresh or dried, it is not only necessary to see that the carbohydrate, fat and protein are in their proper proportions, but it is also necessary to see that provision is made for vitamins.

The discovery of vitamins during the last quarter of a century has profoundly influenced the feeding of infants and, to a less extent, people of all ages.

¹ Where mention is made of the sterilization of milk by boiling, my practice is the usual one of heating the milk in a vessel of water until a skin forms on the surface of the milk and the milk begins to simmer at the edge. The milk is then quickly cooled.

Just as I have passed over details of infant feeding, which can be read in the many books devoted to the subject, so I shall pass over the detailed knowledge which we now possess about vitamins, and shall give only the briefest notes concerning them.

Vitamin A is, of all the vitamins, the most widespread throughout nature. Abundant supplies are available in the livers of certain fish and mammals, in dairy produce from well-fed animals, in eggs and animal fat. Carotene, which is present in yellow root vegetables, green leaves and many coloured fruits and seeds, is readily converted into vitamin A in the animal body.

When there is a gross deficiency of vitamin A in the diet, the most common symptoms are xerophthalmia, keratomalacia and acquired night-blindness. These symptoms are very quickly relieved when vitamin A is added to the diet, and in the early stages can be completely cured. In children, urinary infections, dryness of the skin and skin sepsis (such as intertrigo, sore buttocks and dribbling rashes) are liable to occur.

A great deal has been written about the value of vitamin A in the diet, and much of it is contradictory. One gathers from reading fairly widely of the literature: first, that on the whole our dietary is not deficient in vitamin A, though it may be in the distant portions of our State; secondly, that the average child does not require any supplement of vitamin A above what it receives in a pint of milk per day.

The vitamin B complex consists of fractions B₁ to B₅ and factor Y.

The two main fractions are B₁, the anti-neuritic vitamin, which prevents beri-beri, and B₂, the anti-dermatitis vitamin, which, it is considered, prevents pellagra.

Vitamin B₁ is present in yeast, wheat germ, lettuce, cabbage, spinach *et cetera*. There is no evidence of marked deficiency of this vitamin complex in our diet. The earliest symptom in vitamin B₁ deficiency is loss of appetite and, in experimental animals, this is followed by disturbances in the functioning of the alimentary tract generally. When the amount of vitamin B₁ in the diet has been increased, constipation has disappeared and there has been an increase in the rate of growth.

Vitamin B₂, like B₁, occurs in yeast and cereal germ, but it is also found in abundance in liver. There is a good deal of evidence that pellagra is in some way brought about by a shortage of this vitamin in the diet, although probably other dietetic faults also contribute to it.

Vitamin C is the anti-scorbutic vitamin. It is present in oranges, lemons, spinach, tomatoes and cabbage. It abounds most of all in the suprarenal glands. Szent-Györgi has recently discovered that vitamin C is one of the hexuronic acid series, and, having isolated it, has called it ascorbic acid.

It is said that vitamin C, being very sensitive to heat, is largely destroyed when milk is boiled. In Germany scurvy is rare, despite the almost universal use of boiled milk. Poynton considers

that the persistence of infantile scurvy in England is the result of the use of dried milk, that is, to "feeding babies out of tins", as he calls it. Besides leading to scurvy, absence of vitamin C plays a part in the causation of some anemias and perhaps dental caries. The use of orange, tomato and raw swede turnip juice and of potato cream is the best means of combating a deficiency in vitamin C. Although frank scurvy is rare, an insufficient supply of vitamin C is responsible for ill-defined states of malaise and lack of energy.

Vitamin D is the anti-rachitic vitamin and is present in cod liver and halibut liver oils, eggs *et cetera*. Ergosterol has been proved to be the parent substance of vitamin D and can be converted into vitamin D when irradiated by ultra-violet rays, either before or after being consumed. According to laboratory tests, irradiated ergosterol is a much more potent anti-rachitic substance than cod liver oil. In the last few years a substance which appears to be vitamin D itself has been produced in crystalline form and called calciferol, and this has four times the anti-rachitic power of ergosterol.

Harris has shown that there is not much vitamin D in human or cow's milk, so that it is advisable to make provision for it in the diet of all infants.

As a working rule, a baby of six months requires at least three teaspoonfuls of cod liver oil emulsion daily, even if breast fed.

I shall not refer to the alkaline ash diet or to the excessive use of carbohydrate in the diet, as I know later speakers intend dealing with these subjects.

The next factor of importance in diet is the mineral content. The minerals of which most is known in regard to diet and disease in childhood are calcium, phosphorus and iron. Diets are not likely to be short of the requisite amount of calcium, for milk contains large quantities of it. There is an abundance of calcium in our soil; and diets, good and bad, are generally not deficient in calcium. On the other hand, our soils are poor in phosphorus.

Severe rickets is very rare here. In twelve years I have not seen a case. There are, however, what are considered to be mild cases of rickets, as seen in a fair proportion of our children with minor deformities, such as knock-knee. Throughout the world in general the commonest cause of rickets is insufficiency of vitamin D. I think it rare for rickets to occur on this account in Queensland. There is every reason to believe that we harbour an excess of it in our systems.

Ours is a white race living in a black man's country, with abundance of sunshine in summer and winter, and I should think vitamin D deficiency must be rare indeed. There appears to be a natural danger of hypervitaminosis, and this is aggravated by the indiscriminate use of cod liver oil, halibut liver oil and concentrates of vitamin D, and also by the senseless habit of sunbaking in later years, a condition for which we as a race will one day have to pay. According to laboratory tests, hypervitaminosis is more marked when there is an excess

of calcium and a deficiency of phosphorus in the diet, which condition prevails in Queensland.

Dr. Livingstone, after a long experience in the dental hospitals in England, once remarked to me that he found hypercalcification of the jaws of common occurrence here. This probably is a result of hypervitaminosis D.

Several articles have appeared on the risks of hypervitaminosis in other parts of the world, and in countries much less favoured in regard to sunshine than our own.

Quillian, in Florida, which is in the same latitude as Brisbane, advocated in 1932 great care in the use of vitamin D on account of increased exposure to sunshine and an apparent sensitization to the action of vitamin D.

Warkany, in Vienna, also reported in 1932 on the indiscriminate use of vitamin D preparations. Overdosage leads to disturbances of nutrition and to skeletal changes.

King and Hall reported, after giving massive doses of vitamin D to chickens, that hypercalcemia occurred, and heavy deposits of calcium were observed in the secretory tubules of the kidneys.

In an editorial article in *The Journal of the American Medical Association* for September 24, 1932, it was stated that, experimentally, hypervitaminosis brought about thickening of the fibrous layer of the periosteum, and in the more aggravated forms the lesions simulated *osteitis fibrosa cystica*. There were thinning of the corticalis, widespread fibrous connective tissue replacements, and areas of hemorrhage in the marrow cavity. Later, resorption of the hemorrhagic areas led to cyst-like spaces. There was a distinct rise in blood calcium. The general symptomatology was loss of weight, apathy and marked muscular weakness.

Dr. Livingstone also considered that the marked dental caries in this State was also partly due to an insufficiency of phosphorus in the diet.

We have at hand a ready remedy for phosphorus deficiency in the wheat germ, which most flour millers deliberately remove from the flour. Dr. Gutteridge has tried to popularize the use of first break flour as a porridge, which would thus contain the husk, germ and flour of the wheat. Furthermore, wholemeal bread might be used instead of white bread. Should the roughage be more than the patient can tolerate, an excellent meal called "Cerevite" is now on the market. This meal contains 20% wheat germ, but no husks.

In the last few years the question of iron in the children's diet has been receiving much attention. Dr. Mackay, working in London, has noted the frequency of anemia amongst children. This is readily overcome by adding iron to the diet.

All premature children, and also most twins, even if not anæmic at birth, soon become so, and all such children should be given iron from birth to overcome or prevent the development of anæmia. A grain of iron and ammonium citrate in a little breast milk or in a bottle feed three times a day is an excellent prophylactic.

The diseases of childhood, in which diet plays the greatest part, are, needless to say, rickets, scurvy and the nutritional anæmias to which I have already referred, but there is scarcely a disease in infancy which is not affected by diet.

Beyond the dyspepsias of early infancy, generally the result of too frequent or excessive feeding, there is very little disease in breast-fed children. Dysentery, pneumonia *et cetera* are almost unknown. Even in the case of the unnaturally fed baby the incidence of disease is low if the baby be correctly fed.

The great decrease in dysentery throughout the world in the last decade is directly the result of better and more cleanly feeding, that is, breast feeding, well balanced artificial feeding and the boiling of milk and utensils. Nevertheless, much remains to be done in further educating the public in the proper care of milk, and also in urging on the authorities a stricter supervision of dairies, which, with few exceptions, leave much to be desired. As far as I know, dysentery has never been as severe a menace in Queensland as in the southern States, although this is a hotter climate. No doubt the boiling of milk, which our climate has made compulsory, accounts for this and plays a big part in the very low incidence of tuberculosis in Queensland children.

In recent years the use of the raw apple diet has constituted an advance in the treatment of dysentery and ulcerative colitis. Recently H. Jones and Company, of Hobart, have put a powdered apple called "Applo" on the market, and this is excellent in the treatment of dysentery, more especially in children under twelve months of age.

Constipation may be influenced by diet. It is aggravated by insufficiency of water, fruit and roughage, or by an excess of fat. On the other hand, an excessive roughage in the diet of a small proportion of children causes abdominal pain and the appearance of mucus in the stools.

Acidosis is best treated by a well balanced diet with a sufficiency of glucose. If there is an excess of butter, egg or milk in the child's diet, one must reduce these substances, though it is wrong to exclude all the fats from the diet.

On the other hand, ketogenic diets have lately been used for the treatment of pyelitis and epilepsy. The success of this treatment depends on the β -oxybutyric acid produced. Mandelic acid, which has a similar action to β -oxybutyric acid, but is not oxidized, threatens to displace the ketogenic diet.

Diet is of the greatest importance in the treatment of diabetes, coeliac disease and nephritis, but time will not allow me to deal with those conditions.

Some cases of infantile eczema are due to the lactalbumin in cow's milk. Bray suggests removing the skin which forms on the top of boiled milk, as this contains most of the lactalbumin. The use of hydrochloric acid milk will get rid of what is left.

In fever the diet should contain a minimum of fat and a maximum of carbohydrate, with plenty of sweetened drink and fruit juices, and a very small

quantity of protein. This latter diet is also valuable in the acute stages of nephritis.

Finally, during the course of any chronic disease for which a diet is prescribed, it is the duty of the prescriber to see that all known essential food elements are present.

DIET AND DISEASE IN LATER LIFE.¹

By CLIVE SIPPE, M.B., Ch.M. (Sydney),
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RECENT years have witnessed an increasing recognition of the importance of a correctly balanced diet in the maintenance of good health. Numerous animal experiments and clinical investigations have firmly established the important effects of various dietary deficiencies. This applies not only to the vitamins, but to the various minerals and metals.

Perhaps too much stress has been placed on vitamin deficiencies. Clinically we must not expect to see in Queensland the extreme manifestations of a single vitamin deficiency, such as xerophthalmia, beri-beri, scurvy or rickets. Milder degrees of these diseases probably occur as well—a mixed group with indefinite signs.

The administration of concentrated vitamin preparations is rarely necessary and is not entirely without danger. The difficulty possibly lies in the absence of any exact biochemical test for vitamin deficiency. Excess of vitamin D in the presence of adequate calcium in the diet may lead to various symptoms, such as languor, loss of appetite, and particularly excessive calcification in many organs. The possible relationship of this to atheroma cannot be overlooked.

In the presence of calcium deficiency demineralization of bones will occur.

Sherman, in America, after twenty-five years' experience, states that calcium deficiency is the commonest and most important of any single deficiency. States of lassitude and of indefinite ill-health may occur in these cases. The relationship between calcium utilization and the hypersensitive states is well recognized. Increased permeability of the blood vessels and decreased blood coagulability may also occur.

Various factors may interfere with calcium absorption, and, although the blood calcium may be normal, yet a deficiency in ionized calcium may still occur.

Oxalic acid, occurring in many leafy vegetables, forms insoluble calcium oxalate by interaction with the calcium. Too much fat in the diet interferes with calcium absorption because the fatty acids unite with calcium to form insoluble soaps.

Vitamin D deficiency leads to poor calcium absorption. Calcium is absorbed best from an alkaline medium, and the occurrence of an

¹ Read at a meeting of the Queensland Branch of the British Medical Association on November 1, 1935.

alkalemia lowers the ionized calcium in the blood. This latter fact is of particular importance to Queensland, as Sundstroem has shown that an alkalemia develops in the hot humid summer. Nye and I have shown that the gastric acidity is lowered and that achlorhydria is more common in the summer than the winter.

Milk and cheese are the best sources of calcium, and from these alone adequate amounts of calcium can be obtained. In order to obtain sufficient calcium from other sources impossible amounts have to be eaten, for example, seven loaves of bread, 16 pounds of potatoes, 40 apples, or 200 gallons of tap water per day, whereas one quart of milk or one-quarter pound of cheese will supply the daily needs of calcium.

Nutritional Anemias.

There is only a very slight positive balance of iron in the average diet, so that it will not take a large dietary upset to cause iron deficiency. The result of this is the development of microcytic anemia, which can be cured by the use of large doses of iron. Poor absorption, of course, also is an important factor in these cases.

Pernicious anemia is now recognized as being a conditioned deficiency disease. Normal blood formation is stimulated by hæmopoietin, which is formed by the interaction of an extrinsic factor in food and an intrinsic factor in the stomach. This resulting substance is stored in the liver. Usually pernicious anemia is caused by an absence of the intrinsic factor, but a megalocytic anemia can also be brought about by the absence of the extrinsic factor.

Deficient vitamin B also may cause megalocytic anemia, and vitamin C deficiency a microcytic anemia. Copper does not seem to be of as much importance as was at first thought.

Iodine.

Deficient iodine intake leads to deficient thyroxin formation, with consequent development of colloid goitre. This is not of particular importance to Queensland, although there are a few areas where this deficiency occurs.

Vitamins.

Dr. Earnshaw has discussed the distribution and main functions of the individual vitamins. I shall just say a few words concerning some of them.

Vitamin A, the so-called anti-infective vitamin, is not in the strict sense anti-infective, but acts in an indirect way to this end. Vitamin A deficiency leads to keratinization of squamous epithelium with consequent lower resistance to bacterial invasion. Administration of vitamin A has no effect on the incidence of colds.

Two hundred patients with pneumonia were treated alternately—100 with extra vitamin A and 100 without. The death rate in the first group was 8% and in the second 13%. This is merely suggestive.

Recent experimental and clinical evidence has shown that vitamin A deficiency is related to the aetiology of renal calculi. In some cases the calculi have been made to disappear by the use of additional vitamin A. A diet rich in vitamin A is recommended after operations for calculi in the renal tract.

Vitamin A, applied locally, hastens healing of wounds, and this may in part explain the rapid healing gained by using dressings soaked in crude cod liver oil.

In the treatment of chronic disease such as rheumatism and nephritis it is very important to provide a well balanced diet. Marked restriction of protein in chronic nephritis is not only not necessary, but may be harmful. The body will use its own endogenous protein if none is supplied.

Thus the provision of a well balanced diet will increase vigour and allow the enjoyment of better general health. It will prevent or at least minimize microcytic anemia.

There appears to be a necessity for the formation of some local medical body to control dietetics in institutions and also to control various health foods advertised for various purposes. Furthermore, there is a large scope for further investigation of the results of dietary irregularities in Queensland.

DIET AND DISEASE OF THE EYE.¹

By E. O. MARKS, M.D. (Dublin),
Honorary Ophthalmic Surgeon, Hospital for Sick Children, Brisbane.

WHEN considering the association of diet and disease, we must include in our review not only those diseases directly caused by deficient or improper diet, but also those whose incidence or severity may be influenced by a lowered bodily health due to imperfect diet.

While thus taking into consideration infections the incidence or progress of which may reasonably be suspected of being influenced by diet, it at once becomes essential also to take into account other possible causes of lowered resistance, such as climatic and living conditions or general hygiene, as well as other reasons for increased facility in the spread of contagion, such as flies and dust.

The diet may be only one of several concomitants, each of which must be carefully excluded before the diet can be definitely arraigned.

In the case of straightforward vitamin deficiency disease, such as scurvy or keratomalacia, the problem is comparatively simple. The disease will not occur except with a deficient diet, and a supply of the missing food factor will result in a rapid cure.

In the second case, when the incidence of the disease merely may be influenced by the diet, when

¹ Read at a meeting of the Queensland Branch of the British Medical Association on November 1, 1935.

the disease may occur even on a perfect diet, when other factors may be at work, and when the provision of a proper diet does not by itself effect a cure, the difficulty of apportioning the diet's share of the responsibility is very great.

So far as the eyes are concerned, we in Queensland are very fortunate that direct diet deficiency diseases are very rare. I do not, of course, know the experience of my colleagues, but of xerophthalmia or keratomalacia, the classical vitamin A deficiency disease which is an important cause of blindness in India and China, not a single case has come my way. I can recall only one case of sloughing cornea, in a syphilitic, marasmic half-caste infant on whom the exhibition of vitamins and anti-syphilitic remedies mercifully failed to prevent the sloughing also of its mortal coil. In what proportion bad feeding contributed to the dissolution it was impossible to determine.

For straightforward deficiency diseases my allowance of ten minutes is more than ample. When, however, we come to consider the second class, the incidence of which may be influenced by diet, we enter onto very debatable ground, for the traversing of which ten minutes are altogether inadequate. Of such diseases trachoma is at once the most suspect and the most important, so my subsequent remarks will be restricted to that disease.

In our far inland districts trachoma is very prevalent. In the south-west, west of Thallon and Mitchell, from 7% to 10% of school children are trachomatous. The difficulty of diagnosing an early mild trachoma from the very common follicular conjunctivitis precludes exact figures.

Various ophthalmologists, and notably my good friend Dr. J. Lockhart Gibson, have suggested that trachoma or its incidence is largely influenced by diet deficiencies. It is a suggestion that is not to be lightly turned aside.

That the food and living conditions of many children in the West are far from ideal, no one would deny. However, it is not my brief portion to discuss the general question of the diet, living conditions, climate, and so on in relation to the general health of these children, but only the relationship to eye disease, especially trachoma.

That trachoma is not an actual deficiency disease is manifest for the following reasons: (i) It affects only a fraction of people on the same diet. (ii) It affects people on a good diet. (iii) It does not affect, or at least is very much less common amongst those living on similarly restricted diets in equally remote places nearer the coast. (iv) It is prevalent in other parts of the world where the diet and climate are very different from that of our inland country. (v) It is not cured by the provision of an ample diet, though this is, of course, the first essential to treatment.

I must admit that formerly the suggestion that diet had much to do with the incidence of trachoma in the west appealed to me strongly as one that would probably prove the key to the distribution of the disease, which ordinarily is not readily transmitted from one to another.

Two years ago, on behalf of the Department of Public Instruction, I examined many schools in the south-west of the State, as far out as Thargomindah and Windorah. A six weeks' tour, in which, so far as possible, I visited the homes of the trachomatous children observed at the schools, left me strongly reconverted to the old faith that the disease is an infection chiefly affecting those whose manner of living is best calculated to spread contagion and least calculated to prevent its spread.

The disease is markedly familial, and in nearly every case one or both parents showed old standing trachoma. Most, but by no means all, of the trachomatous families were living in squalid permanent camps, with no precautions to prevent the spread of the disease from one to another. Children in bed with an affectionate but affected mother or with other trachomatous children, the infrequency of washing, the use of common towels, and the lack of care about flies provide ample means for the conveyance of eye infections, even amongst those families otherwise reasonably cared for. The great majority of the badly affected families were living in very bad conditions.

While it is well recognized that in ordinary circumstances trachoma is not readily infectious, opinion has of late tended to the idea that the disease is transmitted in conjunction with an acute conjunctivitis. According to this view, a trachomatous subject with a superadded acute infection would transmit trachoma as well as the acute conjunctivitis. In the west, during the fly seasons, epidemics of acute conjunctivitis are frequent and severe, attacking especially those who take no precautions against infection.

Nearer the coast flies and dust are not nearly so bad, our coastal areas being freer perhaps from flies than most countries, and there is comparatively little acute conjunctivitis and comparatively little trachoma.

While the distribution of trachoma in Queensland is thus consistent with that of an infection, we still have to consider to what extent, if at all, it is influenced by dietary imperfections.

One cannot make a reliable record of the diet of any particular family. Since the trachomatous families are also usually the least well cared for and have the worst living conditions, one would expect that their food would on the average be worse than that of the clean and well cared for, and that their physical condition would on the whole be inferior. A lower average physical condition is thus to be expected as a concomitant of trachoma, whether or not it be a causative factor.

I have no records of weights and measurements, but my impression was that, except in severe cases, where the eye condition might be affecting the general well-being, there was no very marked difference between trachomatous and non-trachomatous children.

Another method of approach is geographical. Railway centres on the whole have greater facilities for fresh foods and vegetables than places far from the rail. How do they compare?

I found schools heavily affected both on the line and off it, and schools free or lightly affected both on the line and far away from it. Thus out of 574 children examined at Charleville, only 15, or 1 in 37, were definitely or doubtfully trachomatous, whereas at Cunnamulla there were 31 in 206, or 1 in 7, while at Wyandra, midway between, there was only one doubtful case in 37. Coming east, at Morven there was not even a doubtful case in 55, but at Mitchell 14 in 152, or 1 in 11. At Langlo, 45 miles from Charleville, there was no trachoma in 12 children. At Quilpie, the western end of the line, there were 23 in 113, or 1 in 5, and at Adavale, 60 miles north from the railway, 5 in 35, or 1 in 7; but at Eromanga, 80 miles west, there were 8 in 16, or 1 in 2.

Taking an east-west line through Tallwood to Thargomindah—at Tallwood there were no cases in 25, at Thallon 4 in 26, or 1 in 6, and Dirranbandi 13 in 73, or 1 in 6; these three places are on the railway. At Nindigully one trachomatous family of 6 in 18 children, at St. George 11 (8 belonging to one family) in 150, or 1 in 14, and Bollon 3 in 47, or 1 in 16. Cunnamulla, on the line, had 1 in 7 (as previously mentioned), Eulo had 5 doubtful cases in 25 children, and Thargomindah 12 in 52, or 1 in 4.

It cannot be too strongly emphasized that figures must not be taken rigidly when one trachomatous family can make an enormous difference by migrating to another township. Such as my figures are, they do not show a steady increase of trachoma with increasing distance from the coast and increasing aridity, nor do they show any relationship to remoteness from the railway. Thallon, Dirranbandi and Cunnamulla, on the railway, are much worse than St. George and Bollon, which are away from the line. Quilpie, on the line, is worse than Adavale, off it, but the small decadent township of Eromanga, 80 miles west of Quilpie, had the highest trachoma rate, namely, 8 out of 16.

Of 1,700 children examined in the west, 9 out of 10 had conjunctivæ which would compare well with the average in Brisbane, my visit being timed purposely to avoid the acute conditions of the fly season.

The impression left strongly on me was that trachoma is due, not to diet deficiency, but to hygiene deficiency, and that its elimination is to be attained by the inculcation of hygienic principles and improved living conditions.

SUGGESTIONS FOR REFORM IN NUTRITION.¹

By NOEL M. GUTTERIDGE, M.B., B.S. (Melbourne),
Brisbane.

Is the food that I eat, that you eat, and the man next door eats as well balanced as it should be? I ask this question because there is a tendency for one's outlook on nutrition to be rather distorted by

thoughts of scurvy, beri-beri and rickets. In Queensland we have a variety and cheapness of foodstuffs available which should make us the prototypes of nutritional excellence, and yet many of us have our doubts. We certainly have one of the lowest death rates in the world, but our general morbidity seems to be about the same as elsewhere.

So let us see just how much of the main items the "man in the street" really does eat, as revealed by official Commonwealth statistics of *per capita* consumption (Table I).

TABLE I.

Commodity.	Per Capita Consumption 1934-1935 (Yearly).	Daily Consumption.	Calories.
Meat	186.0 pounds	8.0 ounces	562
Butter	30.0 pounds	1.25 ounces	260
Flour	202.0 pounds	8.8 ounces	830
Bread ¹	100.0 pounds	4.25 ounces	323
Refined sugar	106.0 pounds	4.5 ounces	495
Milk	72.0 quarts	0.39 pint	77
Cheese	3.75 pounds	0.16 ounce	20
Total calories	2,244

¹ Not included in total.

Meat.

Australia consumes more meat per head of population than Great Britain, Canada and the United States of America, but much less than New Zealand. The figures for 1931-1932 are respectively: Australia, 189 pounds; New Zealand, 250 pounds; Britain, 145 pounds; Canada, 154 pounds; and the United States of America, 133 pounds. Pork products are relatively consumed much more in other countries than they are in Australia and New Zealand.

The tendency of the modern nutritionist is to increase the proportion of meat in the diet. The nephritic is no longer starved of meat. His nutritional balance is just as important as is that of the normal person.

The important point is that meat seems to be harmful only when it is not associated with McCollum's protective foods—raw fruits and vegetables, eggs, milk, cheese and butter. This point can be well demonstrated by a chart showing the relationship between the incidence of degenerative disease and the percentage of protective foods in the diet.⁽¹⁾ (See Chart I.)

The daily total of meat and flour in the Australian diet is over sixteen ounces. This gives a high acid ash; the flour should be reduced and the acid-rich meat balanced by fruit, vegetables and milk. Shortage of alkaline ash foods leads to abnormal protein metabolism with the production of toxic by-products.

It is of interest to note that the first attempt of Minot and Murphy at improvement of pernicious anæmia patients began by increasing their meat intake. They used liver with the idea of providing a concentrated animal protein. Another interesting aspect is that for the first time in history a degenerative disease had been arrested by nutri-

¹ Read at a meeting of the Queensland Branch of the British Medical Association on November 1, 1935.

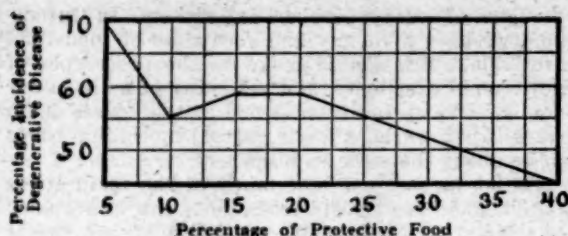


CHART I.

Relationship between the percentage of protective food in the previous diet and the percentage incidence of chronic circulatory disease, chronic arthritis, chronic gastro-intestinal disease, migraine and diabetes in persons over thirty. There were:

43, or 69%, of 62 cases between 0% and 5%
64, or 55%, of 117 cases between 5% and 10%
58, or 59%, of 98 cases between 10% and 15%
32, or 59%, of 54 cases between 15% and 20%
24, or 45%, of 44 cases between 20% and 40%

tional treatment. Other degenerative diseases, as Langstroth⁽²⁾ has shown, can be improved in 73% of cases by a "corrective diet".

TABLE II.

Food Items.	Calories in Protective Foods.	Calories in Non-Protective Foods.
Breakfast.		
Glass of orange juice	100	—
Two eggs	166	—
Fresh fruit	80	—
Glass of milk	160	—
Luncheon.		
One-third head of lettuce	16	—
One tablespoonful of oil	—	93
Two fresh vegetables	80	—
One pat of butter	—	95
Two glasses of milk	322	—
Fresh fruit	80	—
Dinner.		
Meat	—	190
One-third head of lettuce	16	—
One tablespoonful of oil	—	93
Two fresh vegetables	80	—
One pat of butter	—	95
One glass of milk	160	—
Fresh fruit	80	—
Cheese	—	91
Handful of nuts	140	—
Totals	1,490	657
Total calories		2,147
Percentage of protective foods		70

One advantage of meat to Australians lies in its phosphate content.

Butter.

In such an important butter-producing country as Australia a daily consumption of one and a quarter ounces of butter per day seems too low. There are two factors in this: (a) the insipid taste of white bread and butter, requiring jam as a flavouring; (b) the use (as Robert Hutchison has deplored) of jam instead of butter. The experience of Denmark with xerophthalmia holds a warning for Australia, and practitioners in dairying districts tell me that many ills which they are called on to treat yield to nutritional therapy. The dairying folk drink little milk; butter-making in the home

is unknown; and they live mainly on white bread, jam, meat, potatoes and tea. This diet is one which McCarrison showed to be one of the worst that he investigated. I had the mortification of having in my own household an instance of red, painful eyes, diagnosed as scleritis, which resisted all treatment for eighteen months, but which completely cleared up in two weeks on a fish liver oil concentrate (on the suggestion of Dr. T. A. Price, Toowoomba) and which has remained cured for the past two years.

Flour.

Combining flour with sugar, we find that 13.3 ounces of pure carbohydrate is eaten daily. There is a British school of thought which considers that the deficiencies of the pure carbohydrates are made up by the other elements in the diet. This is true up to a point, but when, of a total average of 2,800 calories, nearly half, 1,325, is made up of two purified carbohydrates, the strain of providing all the other nutritional essentials falls heavily on the other half. Also it must be realized that there are other purified carbohydrates in the menu, such as rice, sago, tapioca, arrowroot and macaroni. The total average calorie value of 2,800 is arrived at from the British Medical Association Committee on Nutrition "man value" figure of 3,400, reduced by the women, aged and children in the population.

White flour is so deficient that not even weevils can live in it. Rats live on it for only a few weeks.

Bread.

The vexed question of white or wholemeal bread presents some difficult angles. The nutritional differences have been shown by McCarrison in Table III.⁽³⁾ Identical batches of rats were kept on a basal diet of either wholemeal bread or white bread. To these were added the "extras" detailed.

TABLE III.

Showing the Average Percentage Increase in Body Weight, on the Fifty-fourth Day of Experiment, of Animals fed on Basal Diets of White Flour and Whole-wheat Flour to which various Supplements were made.

Supplements to Basal Diets.	Increase in Body Weight, Per Centum.	
	White Flour.	Whole-wheat Flour.
I. Nil	10.6	65.0
II. Butter (1.25 grammes per rat daily)	26.2	97.1
III. Dried yeast (5%)	107.9	121.8
IV. Butter and dried yeast	116.3	177.7
V. Tomatoes and greens (ad libitum)	41.3	68.1
VI. Tomatoes, greens and butter	35.2	85.8
VII. Meat residue (10%)	17.5	67.2
VIII. Whole milk (ad libitum)	209.6	220.4
(a) Whole milk (1 cubic centimetre)	32.2	81.6
(b) Whole milk (2 cubic centimetres)	40.4	90.9
(c) Whole milk (5 cubic centimetres)	119.5	143.1
(d) Whole milk (10 cubic centimetres)	149.1	177.2
IX. Whole milk (ad libitum) and dried yeast	244.6	242.1

A renewed interest in the relationship of white bread to disease has been aroused by the experiments of Passey and Leese on gastric carcinoma. These experiments are described by Professor D. A. Welsh.⁽⁷⁾ In the presence of a carcinogenic agent, papilloma showing invasive properties developed in the stomachs of rats kept on a diet of white bread

alone, whereas on a balanced diet the stomachs were normal in spite of the presence of the carcinogenic agent. This experiment suggests an added significance to the parallelism of the cancer incidence and the consumption of purified carbohydrates.

As Alvarez has pointed out,⁽⁴⁾ the cellulose content of the wheat grain is completely indigestible and is especially irritating to the visceroptotic type. My own studies have shown that the sthenic type of individual is much benefited by cellulose roughage, and in these types the use of a wholemeal porridge made from a milled wheat known in the trade as "first break" will solve many constipation and nutritional problems. The first break should be obtained direct from the mill, as it gets stale after about four weeks. It is cheap food, a twelve-pound bag costing about two shillings. I consider that it has been the daily use of this porridge since weaning, combined with a pint of milk and reduced sugar, that has been the reason for the dental integrity of two children, aged seven and three years, whose nutrition has been controlled since birth.

Wholemeal bread presents difficulties in baking owing to the impossibility of grinding the bran to a fine state by steel rollers. This can be achieved only by the old-fashioned stone rollers. The presence of the coarse bran in the flour makes a heavy compact loaf. The baker strikes a happy medium in the making of a light wholemeal loaf by reducing the wholemeal flour content and adding crude molasses as a colouring matter.

As wholemeal bread provides a nutritional disability for the lean types, a better suggestion for a universal bread is to replace 10% of the white flour with wheat embryo. This is almost completely digestible, has a delicate flavour of its own, and provides valuable minerals and vitamin constituents. The wheat embryo contains 2.7% of phosphate, and as it is cheaper than white flour and presents no baking difficulties, the bread can be sold at the same price as white bread. It makes a delightful toast.

Sugar.

At the James Mackenzie Institute of Clinical Research, St. Andrews, J. H. P. Paton has been studying the relationship of disease to excessive consumption of carbohydrates.⁽⁵⁾ He has shown that there is a relationship between excess sugar consumption and catarrhal diseases. The incidence of catarrhal illness of more than seven days' duration in a large girls' boarding school was greatly reduced during the war years (see Table IV).

TABLE IV.

School Term.	1904-1913.	1914-1917.
	%	%
Spring	4.15	0.6
Summer	1.1	0.5
Autumn	2.05	1.3
Average per annum	2.6	0.8

He also found that the catarrhal rate in a girls' boarding-school house with the lowest sugar consumption (1.2 pounds per week) was 5.5%, whereas that in a house with the highest consumption (2.2 pounds per week) was 24.6%. Chronic nasal catarrh and tonsil hypertrophy rapidly improved when sugar was withheld.

Personal clinical experience has shown the valuable results achieved in chronic catarrh by restriction of sugar and white flour and the increase of first class protein, wholemeal products and protective foods. Rate of weight gain is increased by such diet.

Excess sugar has been shown by Seale Harris to disturb the secretion of insulin. Hyperinsulinism with hypoglycæmia is followed by an exhaustion hypoinsulinism. Maitland Ramsay⁽⁶⁾ has described the occurrence of visible congestion and exudate in the retinae of patients whose carbohydrate intake is in excess of what they can tolerate, and has pointed out that this is an index of the state of the capillaries elsewhere in the body.

Sucrose is absorbed from the portal vein as glucose and levulose. It is considered that the yearly ingestion of over fifty pounds of levulose places an unusual strain on the hepatic stages of metabolism, as it is greatly in excess of the amount derived from natural foods. It has been suggested that levulose becomes toxic in the systemic circulation. The reason for the modern development of glucose therapy as against sucrose therapy is based on the avoidance of the toxic levulose.

The American outlook on the place of sugar in the diet is that its use should be restricted to that of a flavouring agent. Over four ounces per day is surely exceeding this dictum.

Milk.

The valuable lesson of the Scottish milk experiment is not yet learnt by the public. There seems to be general agreement as to the necessity of a pint per day for children, and there is reason to think that adults would benefit by a like amount. The advent of the "milk bar" is a hopeful modern trend.

Cheese.

Being made from a first class protein, the greater use of cheese would be a step toward a more balanced nutrition, and it would be an advantage if jam were thereby reduced.

Phosphate Deficiency.

As Professor Osborne pointed out in his Bancroft Oration, we have widespread deficiency of phosphates in Australia. Analyses have shown that our grains and vegetables are deficient. Recently there has developed among the cattle in north Queensland a phosphorus deficiency disease known as "peg leg". This is at present being investigated by the Council for Scientific and Industrial Research. This deficiency in human nutrition is accentuated by manufacturing processes, such as flour milling, which remove those elements which are rich in

phosphates. It is for this reason that the inclusion of 10% of wheat embryo (which contains 2.7% phosphate as P_2O_5) is suggested. It is interesting to note that nearly every "tonic", from Parrish's chemical food to neuro-phosphates and "Metatone", contains phosphates as an important constituent. The value of a balanced mineral porridge is shown in the accompanying graph⁽⁸⁾ (Chart II). An almost similar porridge meal to this is available in Queensland under the name of "Cerevite".

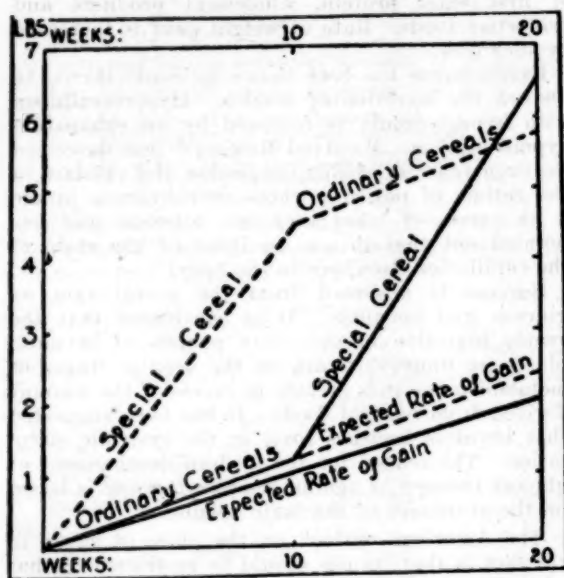


CHART II.

Comparison of the increase in weight of 21 children fed on the special cereal and ordinary cereals.

Nutritional Pathology.

Nutrition is more than a science; it is a basic principle in physiology and pathology, and the nutritional factor in pathology is becoming more and more prominent. In the anæmias today the nutritional aspect dominates the picture. We heard J. S. Fairbairn in Melbourne express the conviction that the problem of the pregnancy toxæmias would yield to a nutritional study. Such diverse conditions as trachoma, tropical ulcer, colitis and barcoo rot are responding to a nutritional approach. The value of wheat embryo in rheumatoid arthritis is pointed out in the British Medical Association report. At the last Pan-Pacific Conference in Sydney it was shown that leprosy could be markedly improved by nutritional means alone. The relationship between nutritional imbalance and lymph gland hypertrophy, constipation, peptic ulcer, nasal catarrh, decayed teeth and pyorrhœa is being developed. Progress will be made when these disorders are regarded as a symptom of generalized nutritional deficiency and not as a disease. McCarrison insists that nutritional deficiency is responsible for a very large proportion of human ill-health today, and he stresses the importance of recognizing the widespread occurrence of mild

deficiency. He bases this contention on experimental evidence obtained from thousands of animals.

Today our standards of normality are in the melting pot. Can anyone describe a normal tonsil? Dr. Fish, the senior lecturer for the Dental Board of Great Britain, told us in Melbourne that he could not obtain a specimen of a normal human gum margin. Are we satisfied with the physical standard of the average Australian?

Most people take it for granted that the type of human being that constitutes what is called a normal man today is the best type of human being that can be produced, notwithstanding the fact that careful breeding and scientific housing and feeding of animals enable the breeder to develop superlative stock.⁽⁹⁾

Nutritional Therapy.

To prescribe a concentrated vitamin preparation in the presence of an obviously one-sided diet only disturbs further the balance of an already unstable nutritional equilibrium. The interdependence of the various nutritional factors is not sufficiently appreciated, and this is just where the food faddist fails. Even a classical vitamin deficiency will respond more rapidly when the other items are brought into balance.

The menus of boarding schools in Brisbane that I have investigated show gross nutritional imbalance. Milk only in tea and with the rice or oatmeal for breakfast. No raw vegetables, and one apple each on Sunday. Meat twice daily with white bread, potatoes, pumpkin, little butter and much jam, and as a special treat for Sunday's tea, scones!

Our traditional ideas on diet in disease are rudely shaken by the modern advances—raw apple in the diarrhœas of infancy and colitis (Earnshaw), the work of the Mayo Clinic on the non-absorption of raw egg, and the poor biological value of gelatin protein.

The path of nutritional integrity leads us toward the dairy products: milk, well cooked eggs, cheese, butter, raw vegetables, raw fruit, wheat embryo-reinforced bread, orange juice, and meat, especially the liver and kidneys. Our sense of taste, spoiled by sugar and smothered with purified starch, must be reeducated to those traditional Devonshire flavours.

And in our daily practice, if we investigated the possibilities of balanced nutritional therapy with half the enthusiasm that we try the proprietary preparations that are so sedulously brought under our notice, some real progress would be made.

The time has come for nutrition committees of the British Medical Association to be formed in every Australian Branch, to collect further statistical evidence of the relationship of nutrition to disease, and to follow in the footsteps of the London British Medical Association Nutrition Committee and the Committee on Foods of the American Medical Association.

And finally we should avoid the anomaly of the bald-headed chemist selling a bottle of hair restorer. As we are selling health, we and our children should be as healthy as modern nutrition can make us. Which brings me back to my opening sentence, and the answer is: "No."

References.

- ⁽¹⁾ L. Langstroth: "Relation of American Dietary to Degenerative Disease", *The Journal of the American Medical Association*, Volume XCIII, 1929, page 1609.
- ⁽²⁾ L. Langstroth: *Loco citato*, page 1608.
- ⁽³⁾ R. McCarrison: "White and Brown Bread", *The British Medical Journal*, November 16, 1929, page 913.
- ⁽⁴⁾ W. Alvarez: "Treatment of Nervous Indigestion", *Collected Papers of the Mayo Clinic*, Volume XIX, 1927, page 65; *The Journal of the American Medical Association*, Volume LXXXIX, 1927, page 440.
- ⁽⁵⁾ J. H. P. Paton: "Relation of Excessive Carbohydrates Ingestion to Catarrhs and other Diseases", *The British Medical Journal*, April 29, 1933.
- ⁽⁶⁾ Maitland Ramsay: "Some Early Ocular Symptoms of Over-Indulgence in Sugar and Sweet Farinaceous Food", *The British Medical Journal*, February 18, 1933, page 266; quoted by J. H. P. Paton.
- ⁽⁷⁾ D. A. Welsh: "Progress of Cancer Research", *Journal of the Cancer Research Committee of the University of Sydney*, Volume VI, February 1, 1935, page 113.
- ⁽⁸⁾ A. Brown and F. Tisdall: "The Role of Minerals and Vitamins in Growth and Resistance to Infection", *The British Medical Journal*, Volume I, 1932, page 55.
- ⁽⁹⁾ Editorial, *The Journal of the American Medical Association*, January 16, 1931.

DIET IN DISEASE.¹

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We learn from the ancient physicians, Hippocrates, Paracelsus and Galen, the importance of prescription of diet. As long ago as A.D. 1100 the medical school of Salerno laid great stress on the value of diet in the treatment of disease. While some of their methods may be at variance with our present practice, the following rhymed version of an English translation contains the principles of dietetics:

Doctors should thus their patients' food revise.
What is it? When the meal and what its size?
A stated diet, as it is well known,
Of Physic is the strongest corner-stone.

Diabetes Mellitus.

Patients suffering from the common disorder, *diabetes mellitus*, fall into two distinct groups: those suffering from a severe form of the disease, often familial, in which insulin is required, and those, often more elderly, patients who can be maintained in health by dietetic restriction alone.

Once it has been decided that the sugar tolerance of the patient has been so reduced as to necessitate insulin injections, many of the more rigid dietetic restrictions may be relaxed. Even though perhaps larger doses of insulin may be required, a more adequate diet should be prescribed for the patient

has to suffer the discomfort of subcutaneous injections twice or three times a day. The difference in cost and in discomfort to the patient between the injection of 15 units and 25 units of insulin is small, and patients of average intelligence rapidly learn to make a fairly accurate visual estimate of the quantity of food in a serving. All that is required is perhaps a weekly check by careful weighing, while the daily test of the urine with Fehling's solution prevents the majority of patients exceeding their prescribed diet. There is no need to exclude the more palatable carbohydrates from the diet, and a patient soon learns to select his requirements from the general menu.

The urine of a large proportion of the milder type of diabetics may be kept sugar-free by diet alone, and I have yet to meet the diabetic who would not go to the extreme of dietetic restriction if by so doing he could avoid the necessity of insulin injections. Such dietetic control must be rigid—a measured diet is essential in all, and the majority need to weigh most of their food. These diabetic diets need not be irksome; a diet of 1,500 calories containing 150 grammes of carbohydrate can be made not only satisfying, but also palatable. White bread and potatoes are included in all but the lowest caloric diets, and the more satisfying fruits and vegetables are also used.

Although loss of weight is one of the symptoms of the disease, many diabetics are still overweight at the beginning of treatment. Glycosuria is more easily controlled if the patient is a few pounds below his optimum weight. Reduction of weight should be produced without starvation; a hungry patient is almost certain to break his diet, and therefore even a reduction diet in diabetes should contain sufficient food to satisfy hunger. Satisfaction is not merely bulk—palatability and the period during which a particular food remains in the stomach are just as important as a large volume of food material.

On the other hand, many diabetics are below normal weight when they first present themselves for treatment. On a rigid diet the glycosuria lessens and there may be some gain in weight. If insulin is administered to these thin diabetics a remarkable accretion of weight follows. Not only does the weight increase, but the sense of well-being and ability to do heavy work also increase. Large variations in weight in the first few days of insulin treatment are most likely due to changes in water balance. A temporary derangement of vision at this time is due to the rapid alteration in refractive indices of the media of the eye. A permanent and progressive improvement in health associated with gain in weight is well illustrated by a recent case.

A man of 181 centimetres (six feet one inch) in height weighed 62.55 kilograms (nine stone thirteen pounds) in March, 1935. At that time he had glycosuria and peripheral neuritis. He was given a diet of 1,900 calories and the administration of insulin was commenced. In September, 1935, his weight was 71.5 kilograms (eleven stone five pounds). He works eight hours a day stoking a boiler. On Sunday, when he does no manual work, he has to increase his insulin dosage, as otherwise he has

¹ Read at a meeting of the Northern Division of the Tasmanian Branch of the British Medical Association on November 16, 1935.

glycosuria owing to the smaller utilization of glucose by his muscles. (See Figure I.)

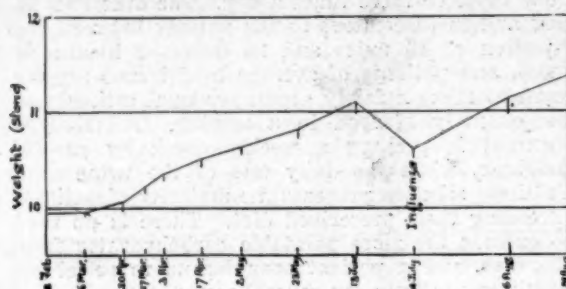


FIGURE I.

During intercurrent disease the carbohydrate tolerance falls and larger doses of insulin are required. Often an entirely fluid diet is more suitable than the bulky diet in common use. Reduction of bulk without alteration of the ratio of protein, carbohydrate and fat can be produced by a simple adjustment of foods.

During convalescence a light, easily digested diet is appreciated, the balance of protein and carbohydrate and fat being maintained throughout the changes from fluid through light to the final full diet. Similar bland diets are used for patients in whom the diabetes is associated with gastro-intestinal lesions, such as peptic ulcer or infections of the bowel.

A full diabetic diet is as follows. Calories, 1,645. The total value of this diet is: carbohydrate 154, protein 70, fat 83. This is divided equally between three meals.

Breakfast: $\frac{1}{2}$ ounce cereal; 1 egg; $\frac{1}{2}$ ounce bacon; 6 ounces 10% fruit or 4 ounces 15% fruit; 1 ounce bread; $\frac{1}{2}$ ounce butter; 4 ounces milk.

Dinner: 2 ounces meat or fish, 2 eggs or $1\frac{1}{2}$ ounces cheese; 5 ounces 3% vegetables; $2\frac{1}{2}$ ounces 6% vegetables; 3 ounces potato; 4 ounces 10% fruit or 3 ounces 15% fruit; $\frac{1}{2}$ ounce bread; $\frac{1}{2}$ ounce butter; 2 ounces milk.

Tea: 2 ounces meat or fish, 2 eggs or $1\frac{1}{2}$ ounces cheese; 5 ounces 3% vegetables; $2\frac{1}{2}$ ounces 6% vegetables; 7 ounces 10% fruit or 5 ounces 15% fruit; 1 ounce bread; $\frac{1}{2}$ ounce butter; 4 ounces milk.

A light diabetic diet follows. The total value of this diet is: carbohydrate 154, protein 70, fat 85 (it is used during convalescence from acute illness).

Breakfast: Gruel (5 ounces milk, $\frac{1}{2}$ ounce oatmeal); boiled egg; 2 ounces toast; $\frac{1}{2}$ ounce butter; 5 ounces milk coffee.

Dinner: 2 ounces fish; 3 ounces mashed potatoes; 3 ounces purée of carrots; 5 ounces milk junket; 1 ounce cream; $\frac{1}{2}$ ounce butter; 5 ounces orange juice.

Intermediate Feeding: Tea (with 2 ounces of milk).

Tea: Creamed celery soup (3 ounces milk, 2 ounces purée of celery, $\frac{1}{2}$ ounces cream); 1 ounce toast or bread; custard (5 ounces milk, 1 egg, saccharin, essence); fruit (6 ounces of 10% or 4 ounces of 15%); tea (with 2 ounces of milk).

A typical diabetic diet of 1,645 calories includes 154 grammes of carbohydrate, 70 grammes of protein and 83 grammes of fat. In the full diabetic diet these quantities are divided equally between three meals.

A liquid diabetic diet as follows is used during fever or in recovery phase of coma. The total value of this diet is: carbohydrate 154, protein 70, fat 83.

Breakfast: Gruel (5 ounces milk, $\frac{1}{2}$ ounce oatmeal, 12 grammes lactose); coffee (5 ounces milk).

Intermediate Feeding: Egg flip (5 ounces milk, 1 egg, $\frac{1}{2}$ ounce cream, 11 grammes lactose).

Dinner: Potato soup (5 ounces milk, 1 egg, 8 grammes lactose).

Intermediate Feeding: Orange egg-nogg (5 ounces orange juice, 1 egg, 7 grammes lactose).

Tea: Tomato soup (3 ounces tomato pulp, 3 ounces milk); coffee (5 ounces milk, 6 grammes lactose).

Supper: Egg flip (5 ounces milk, 1 egg, 7 grammes lactose, 1 ounce cream); orange juice (5 ounces).

Ketogenic Diets.

The production of a therapeutic acidosis may in some patients modify the course of idiopathic epilepsy, of pyelitis and occasionally of migraine and asthma. The ease with which ketosis can be produced varies in different individuals, and therefore a series of ketogenic diets has been developed. The ratio of fatty acid to carbohydrate in the diet in common use is 3:1, but diets of higher fat content may be necessary. The problem in this diet is to make it palatable; nausea and gastro-intestinal symptoms often necessitate the use of diets of lower ketogenic value and may even mean cessation of ketogenic treatment. The complete exclusion of sugar, bread and potato from these diets limits their use to patients who sincerely cooperate.

The results are good in idiopathic epilepsy in children and in young adults in whom the fits are relatively frequent. It seems hardly justifiable to inflict what must be admitted is a most unpleasant diet on a patient whose fits occur at long intervals.

If the patient has been on bromides, phenobarbital or "Prominal", these drugs should be continued throughout the ketogenic treatment.

The intake of water should be restricted in all cases of epilepsy, even if a full ketogenic treatment is not instituted. In some children on a ketogenic diet a single glass of water may precipitate a convulsion. A test that is sometimes used to distinguish between hysteria and idiopathic epilepsy is to give large volumes of water to the patient; if fits occur or increase in number, the condition is true epilepsy.

In adult females with chronic pyelitis the results of all forms of treatment are depressing both to patient and to doctor. In a few cases the production of an acid urine containing ketone bodies not only relieves symptoms, but also renders the urine free of bacteria. To obtain results it is necessary to produce a high degree of ketosis and a very acid urine. After seven to ten days, even if the ketogenic diet is maintained, the acidity of the urine lessens and large doses of ammonium chloride are needed to maintain the acidosis.

If symptoms are relieved, there is usually no difficulty in keeping these patients on the diet for three to six months; thereafter a recurrence of infection is unlikely. Before commencing keto-

genic treatment of a patient with chronic pyelitis one must be confident that there is no renal calculus or other primary cause of the renal infection.

Recently there has been introduced a new therapeutic substance—mandelic acid. The effects of ketosis are produced in the renal tract without the discomfort of a ketogenic diet.

Intractable cases of migraine occasionally react to a ketogenic diet. Headache occurring at frequent or regular intervals, particularly the menstrual type of migraine, is the most suitable for treatment by ketogenic diet.

A ketogenic diet with a ratio of 3:1 is as follows.

Breakfast: 1 egg; 1 ounce bacon (cooked weight); 5 ounces 3% vegetable; $1\frac{1}{2}$ ounces butter; 1 ounce cream (35% butter fat); black coffee; bran wafer.

Mid-Day: 2 ounces meat or fish or 2 eggs or $1\frac{1}{2}$ ounces cheese; 5 ounces 3% vegetable; 2 ounces 6% vegetable; Hollandaise sauce (2 ounces butter, 1 egg yolk, lemon juice and water); $1\frac{1}{2}$ ounces 10% fruit; custard (1 egg, 2 ounces cream, 3 ounces water, saccharin, vanilla); black coffee with $\frac{1}{2}$ ounce cream.

Evening: Stuffed eggs with 1 egg and $\frac{1}{2}$ ounce cheese; 5 ounces 3% vegetables (salad); 1 ounce oil mayonnaise; 2 ounces cream; $1\frac{1}{2}$ ounces 10% fruit; 1 ounce butter; bran wafer; black tea with lemon.

Total: Calories 2,544; carbohydrate 27, protein 55, fat 246.

Alkaline Ash Diets.

In contrast to the preceding diets, the production of an alkaline urine is the object of dietetic treatment in some types of nephritis. It has been shown that the incidence of nephritis in scarlet fever is much lower when the urine is kept alkaline throughout the febrile stage of the illness.

The duration and severity of the symptoms of acute nephritis are modified by the use of high alkaline ash diets and progression to chronic nephritis is rendered less inevitable. Large doses of potassium salts are also used to maintain the salt balance on the alkaline side. Further, it has been claimed by some physicians that the course of chronic nephritis can be modified by prolonged alkalization.

All vegetables and fruits (except prunes and cranberries), especially dried fruits, produce an alkaline urine, while meat, eggs and cereals tend to render the urine acid.

A high alkaline ash diet is as follows.

Before Breakfast: Orange or lemon drink.

Breakfast: Fruit, large serving, raw or stewed; bread, two slices; butter, in moderate quantity; cocoa or coffee made with milk; sugar, in large quantity.

Between Meals: Orange or lemon drink.

Dinner: Meat or fish, small serving; potatoes, large serving; vegetables, large serving; fruit, raw or stewed, large serving; tea or coffee with milk and sugar.

Between Meals: Orange or lemon drink.

Tea or Luncheon: Soup, made with vegetables and milk; one egg, or small serving of cheese; salad, large serving; salad dressing, small amount; bread, two slices; butter; fruit, large serving; tea or coffee with milk and sugar.

Supper: Milk.

Only the stated amounts of meat, bread, eggs and cheese may be taken. The patient may have unlimited amounts of fruit, vegetables, butter, jam, sugar, raisins and cream.

Puddings allowed are junket, blancmange made with cornflour, lemon sago, sago or tapioca with milk, raw or stewed fruit. Cornflour, not flour, must be used for thickening.

Oranges, lemons and potatoes have been found particularly valuable in promoting alkalinity.

Diets for Chronic Constipation.

The toxæmia that is frequently associated with constipation results in the main from the use of purgatives. The treatment of constipation consists in careful dieting with perhaps the addition of hygroscopic substances, as agar-agar, or the use of non-irritant lubricants, as paraffin oil.

The usual procedure is to stop all purgatives and to clear the bowel of feces by repeated enemata or bowel wash-outs. The diet contains fruit, vegetables and whole grain cereals of sufficient fibre content to provide an adequate residue to distend the colon and so to stimulate the evacuation reflex. A mixture of bran and crude molasses may be added to the diet of some patients.

Some individuals are unable to cope with a diet which is large in volume. Normal bowel action may be assisted in this group of patients by the use of a diet containing excess fat, which not only stimulates peristalsis but also reduces the absorption of food and fluid from the bowel.

The above methods of treatment are effective in the majority of patients. If there is no relief of constipation, an organic obstruction of the bowel or a lesion of the nervous system should be suspected. A full investigation of the patient is necessary in every case of constipation.

A high-residue diet is as follows.

Breakfast: Porridge or other whole-grain cereal; egg; wholemeal bread or toast; butter, marmalade; fruit, raw or stewed (skins should be eaten); tea or coffee.

Between Meals: Raw fruit.

Dinner: Meat or fish; potatoes, cooked in skin (some of skin should be eaten); vegetables, large serving; fruit, raw or stewed; tea, coffee or water.

Between Meals: Raw fruit.

Tea or Luncheon: Meat, fish, eggs or cheese; salad, large serving; wholemeal bread and butter; fruit, raw or stewed; tea or coffee.

Supper: Raisins and nuts.

If bran and molasses are recommended, mix overnight three tablespoons of bran with one and a half tablespoons of molasses; next day take one-third after each meal.

Non-Residual Diets.

A non-residual diet is difficult to obtain, but many varieties of low-residue diet are in common use. If the requirement is merely a non-residual diet of a few days' duration, a diet composed almost entirely of carbohydrate of the easily assimilable variety is sufficient—glucose or lactose added to

drinks, fruit juices or sweets of the plain boiled "lolly" type form the main items of such a diet.

For longer periods an adequate amount of protein must be added. Milk, although liquid, produces an appreciable residue in the bowel and must be avoided in low residue diets. Honey or jelly should be used in place of jam.

The following is an example of a low-residue diet.

Breakfast: Strained gruel; poached, boiled or scrambled egg; stale white bread or crisp dry toast; butter; honey or jelly; tea with sugar and milk.

Dinner: Tender lean meat or fish; mashed potatoes; *purée* of vegetables; milk pudding; tea or coffee with milk and sugar.

Tea or Luncheon: Strained soup; fish or egg; stale white bread or crisp dry toast; jelly or honey; tea or coffee with milk and sugar.

Obesity.

"For to be exactly stout enough, neither too much nor too little, is for women the study of their life."

Brillot-Savarin.

The cult of a correct weight is not confined to woman nor is it merely a vanity. *Diabetes mellitus* and arteriosclerosis are often preceded by or accompanied by obesity. The greatest enemy of a patient with hypertension is increase in his weight. Lobar pneumonia is more common and of more grave prognosis in the obese than in those of normal weight. The risk of pulmonary and other complications of surgical operations is greater in stout patients than in thin subjects.

The optimum weight varies with the height, age and sex of the individual, and minor variations from this normal are of little importance. But when the excess weight reaches 20% of the correct weight then reduction treatment is indicated.

Various classifications of obesity have been put forward—endogenous, exogenous, endocrine *et cetera*. The common factor in all forms of obesity is over-eating. Excess consumption of food may be secondary to some known cause, for example, in some lesions of the thyroid or pituitary gland or other organs. Increased appetite may be the result of stimulation from the nervous system or ductless glands; on the contrary, it may be merely the result of habit.

The treatment of all forms of obesity is reduction of the intake of food; in some instances thyroid extract or other therapeutic substances may also be required.

The method of treatment advocated is to place every patient on a standard diet of approximately 1,300 calories. This diet not only has sufficient bulk, but also is palatable and usually satisfies hunger. For men doing heavy manual work the diet is not reduced below 1,500 calories, the extra 200 calories being mainly protein in origin. The diets are ordered by weight. The mere guessing of food quantities is not advisable during the early days of treatment. When the patient has actually lost an appreciable amount of weight and thereby gained confidence in his treatment, then, and not

till then, can estimates of the amount of food replace the use of scales.

The following is a reduction diet, the caloric value of which is approximately 1,300 calories.

Breakfast: Two thin slices of bread or toast (2 ounces); two level teaspoons butter ($\frac{1}{2}$ ounce); medium serving of 10% fruit (4 ounces); tea with milk, without sugar.

Dinner: Medium serving lean meat or fish (2 ounces); medium serving plain boiled potato (3 ounces); large serving vegetables (6 ounces); medium serving of 10% fruit (4 ounces); tea with milk, without sugar.

Tea or Luncheon: Two eggs or medium serving of lean meat, fish or cheese (2 ounces); large serving of vegetables (salad or cooked vegetables) (6 ounces); two thin slices of bread (2 ounces); two level teaspoons of butter ($\frac{1}{2}$ ounce); medium serving of fruit (4 ounces); tea with milk, without sugar.

The daily allowance of milk is half a pint.

These diets contain white bread and potato in small amounts and do not necessitate the use of expensive food substitutes. All meals are taken dry, followed by tea or coffee without sugar; saccharin may be used if the omission of sugar is too great a hardship. Patients are instructed that if they are ever hungry they may take clear broth or a raw apple or tomato.

The results both in a large out-patient clinic and in private practice have been good (see Figure II). The gratitude of a patient who has been reduced by one or two stone weight is sufficient reward for the trouble taken.

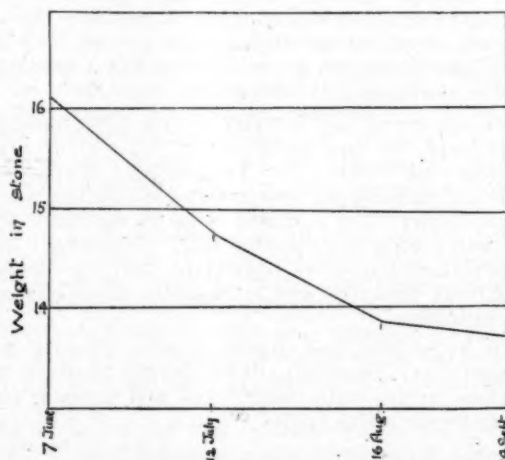


FIGURE II.

Showing the result of dietetic treatment in obesity. The patient complained of dyspnoea on exertion and of a chronic winter cough. His pulse rate was 50. His systolic and diastolic blood pressure readings were 150 and 100 millimetres of mercury respectively. A reduction diet of 1,500 calories was given. The loss of weight in three months was 16.65 kilograms (two stone nine pounds). His weight at the beginning of treatment was 103.05 kilograms (sixteen stone five pounds); at the end of treatment it was 86.4 kilograms (thirteen stone ten pounds).

Dyspnoea is a common symptom of obesity and usually disappears after reduction of weight. Arteriosclerosis with cardiac or cerebral symptoms is often associated with obesity. Removal of twenty pounds of superfluous fat reduces the effort required

to move the patient and so relieves the heart (see Figure III). It is equivalent to the removal of several thick overcoats. (This latter remark was made by a patient after treatment.)

Multiple arthritis is often benefited by a low carbohydrate reduction diet; this particularly applies to the arthritis of hip and knee common at the menopause.

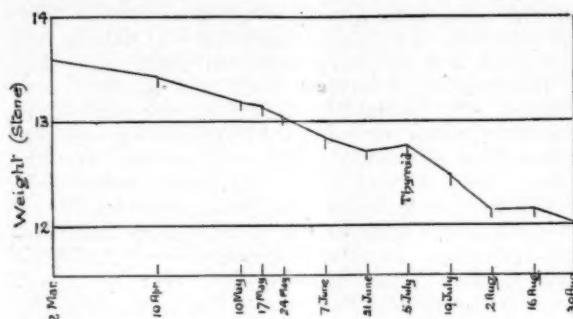


FIGURE III.

Showing result of treatment in a case of hyperpiesia with peripheral vascular occlusion. The patient had gained 15.75 kilograms (two and a half stone) in two years. Her systolic blood pressure was 190 and her diastolic pressure was 110 millimetres of mercury. Her feet were cold; no pulse could be felt in the *dorsalis pedis* artery. She complained of pain in the muscles of the legs. She was given a reduction diet of 1,400 calories, and later was given 0.03 gramme (half a grain) of thyroid extract twice a day. Her weight at the beginning of treatment was 85.72 kilograms (thirteen stone eight and a half pounds); at the end of treatment it was 75.6 kilograms (twelve stone).

During the first two weeks the loss of weight is very rapid; this is largely due to loss of tissue fluid, and in some instances is accompanied by a mild ketosis. Later the loss is slow and the weight usually falls at the rate of about 1.8 kilograms (four pounds) per week. After some weeks the weight may become stationary; if the pulse rate is slow and there are no other contraindications, then thyroid extract may be used. The dose at first should be small, 0.03 gramme (half a grain) of *Thyroid Siccum* (British Pharmacopoeia) twice daily, with gradual increments up to 0.09 gramme (one and a half grains) three times a day. Even in patients with no symptoms of hypothyroidism, thyroid extract causes loss of weight. Dinitrophenol and similar substances increase metabolism, but the toxic effects exclude the use of these drugs.

In old age weight should be reduced slowly. Elderly patients often show ill-effects of loss of weight—the connective tissues have less resiliency and are unable to adapt themselves to change in volume. The presence of atheroma, a past history of cerebral vascular accidents or of anginal pain should suggest caution in the use of reduction diets. Coronary thrombosis occasionally occurs during the reduction régime.

In children excessive fatness is sometimes endocrine in origin, but is more often due to habit of over-eating, particularly of sweets. Obesity running in families is usually due to the family all eating similar large meals. The obesity of childhood

usually requires no treatment; after puberty the weight becomes normal. Even the pituitary type of child, the child with Fröhlich's syndrome, frequently becomes normal in early adult life unless there is a definite pituitary adenoma. Thyroid extract is not indicated for the treatment of obesity in childhood unless there is definite evidence of sub-thyreoidism.

Exercises, hot air baths and massage are merely accessories to diet in the treatment of obesity. Strenuous exercise is usually followed by over-eating and over-drinking, and any weight lost during exercise is rapidly made up. Severe exertion is dangerous to the arteriosclerotic. Massage is of value in preventing the development of wrinkles after reduction of weight. By increasing the circulatory tone in local areas, suitable massage may alter the distribution of subcutaneous fat. Reduction diets should be maintained in every patient until the weight has fallen to within 20% of the optimum weight for the height and age. At this stage more concentrated foods may be added, the diet being gradually increased to about 2,000 calories. The patients should be trained to eat small meals, and the appetite rapidly becomes adjusted to the new level. Thyroid extract should not be continued after the weight has fallen to the required level. Thyroid extract should never be allowed to replace dieting; thyroid is merely an adjuvant to efficient diet control. Thyroid addiction is by no means uncommon, particularly in nurses.

Diets that are not carefully measured are responsible for the majority of failures to lose weight. If a patient does not show a reduction of weight in the first week on a 1,300 calorie diet, one can be certain that the diet is not being accurately maintained. If such "failures" are put to bed in hospital and rigidly dieted, a loss of weight is inevitable. Bed rest alone usually results in a certain degree of loss of weight.

No one can be satisfactorily reduced in weight who does not wish to be, and it should be remembered that most fat persons, though they may not admit it, take delight in eating (J. H. Means).

An attempt has been made to present some practical methods of applying the science of dietetics to the treatment of disease in general practice. The assistance of a trained dietitian is of great value, but much can be done by the physician and even more by cooperation between physician and patient. The art of dietetics is not merely the prescribing of a rigid diet; it usually means careful discussion of the diet with the patient, an acceptance of personal likes and dislikes, and often a compromise between science and reality.

Acknowledgements.

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THE RELATIONSHIP OF THE PITUITARY GLAND TO CARBOHYDRATE METABOLISM.¹

By A. B. CORKILL.

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I FEEL that it is impossible adequately to discuss the influence of the pituitary gland on carbohydrate metabolism without briefly considering its general physiology. Until recently our knowledge of pituitary function was largely confined to that of the posterior lobe, and, although there was some reason to believe that the anterior portion was in some way associated with growth and sex function, no definite evidence of hormonal activity had been elicited. During the last few years, however, our knowledge has advanced in an amazing fashion, so that now it is difficult to realize that the anterior lobe was not recognized as a most important factor in the control of some most vital bodily functions. That such, indeed, was the case may be illustrated by the following extract from a lecture delivered in 1925 by Sir Henry Dale:

It is the anterior lobe which under the microscope has the glandular appearance; the posterior, except for the glandular investment of *pars intermedia*, appears to consist of degenerate nervous tissue and has little cellular structure. Looking at the histology of the different parts, one would be inclined to predict that, if hormones were produced by such an organ, it would be from the glandular-looking anterior lobe that we would be able to extract them. As a matter of fact it is doubtful whether anyone has succeeded in extracting hormones from the anterior lobe, while the posterior, and particularly the remarkably featureless nervous portion of it, yields an extract of immediate physiological activity on several distinct bodily functions.

These remarks can no longer be applied to the anterior lobe, and in fact the rôles of the two lobes have, from the standpoint of complexity and importance of function, been completely reversed. We have now come to realize that the anterior portion of the pituitary secretes principles that markedly influence growth, sex function, carbohydrate metabolism and other internal secretory glands, such as the thyroid and pancreas. To anticipate slightly, I may state that several distinct hormone fractions have already been isolated, namely, growth-promoting, thyreotropic, adreno-tropic and diabetogenic.

Structure of the Pituitary Gland.

The human pituitary consists of two distinct portions formed respectively from the roof of the stomodæum and the floor of the third ventricle. This latter nervous portion develops as a funnel-shaped structure ending in a club-like mass—the *pars nervosa* of the adult pituitary. The stomodæal portion becomes invaginated to invest the nervous part and forms the *pars anterior* and the *pars intermedia*, the latter being a thinnish layer of cells

investing the *pars nervosa* and reflected onto the *pars anterior*. The *pars nervosa*, together with the *pars intermedia*, forms the posterior lobe, whilst the anterior comprises the *pars anterior* with its thin layer of *pars intermedia*.

From the *pars anterior* a thinnish layer of cells (the *pars tuberalis*) spreads out backwards over the adjacent brain tissue. Recently it has been shown that injury to the *pars tuberalis* may produce many of the symptoms usually attributed to pituitary dysfunction. The exact significance of this is not yet clear, but will be referred to later.

Histologically the two lobes are strongly contrasted. The posterior, apart from the *pars intermedia*, appears to consist of degenerate nervous tissue and has little cellular structure. On the other hand, we are able to distinguish several cell types in the anterior lobe and, furthermore, to associate these with definite physiological functions. As determined by their reaction to acid and basic stains, three types of cells have been described, namely, neutrophile, acidophile and basophile. The acidophile cells are considered to be concerned with growth, and their over-activity leads to gigantism or acromegaly, whilst aberrant function of the basophile cells produce pathological gonadal states. In the condition described by Cushny as "basophilism", a small adenoma of the basophile cells is associated with obesity and diminished sex function.

From the standpoint of carbohydrate metabolism, both lobes of the pituitary appear to contain principles that exert a controlling influence in this direction, and since our earliest knowledge of pituitary function was in relation to the posterior, I now propose to consider the physiology of this portion of the gland.

Historical.

In 1895 Oliver and Schafer demonstrated that the pituitary gland yielded an extract which, when injected intravenously into animals, caused an immediate and sustained rise in blood pressure. Howell was able to show that the activity was confined to the posterior lobe and at a later date other actions were discovered. The most important effects produced by posterior lobe extracts may be summarized as follows:

1. **Pressor Effects.**—Causing an immediate and sustained rise of blood pressure in the anæsthetized animal. As far as we can ascertain this effect is produced by contraction of the smooth muscle in the vascular walls. It must be realized, however, that posterior lobe extract, now known commercially as pituitrin, has no effect on the blood pressure of a normal human or a non-anæsthetized animal. Therapeutically it has a beneficial effect in cases of surgical shock when there is a subnormal blood pressure.

2. **Oxytocic Effects.**—Dale in London, and independently Frank-Hochwart and Fröhlich in Vienna, observed another action, which forms the basis of the commonest application of pituitrin in therapeutics,

¹ Read at a meeting of the Alfred Hospital Clinical Society, February, 1935.

namely, a powerful stimulant action on the smooth muscle of the uterus. This action is part of a more general action on all smooth muscle, including that of the intestine. These actions suggest the application of pituitrin in surgical shock, uterine inertia, *post partum* hæmorrhage and intestinal paresis. Shortly after the demonstration of the pressor and oxytocic principles in posterior lobe extracts there was considerable diversity of opinion as to whether we were dealing with one or more active principles. The leading exponent of the unitary theory was Abel, whilst Dale, Dudley and others held the view that at least two active principles were involved. The position was completely clarified when Kamm and his associates isolated two separate fractions as white powders. One had a stimulant action on smooth muscle and did not contain any obvious pressor activity, whilst the other had a marked pressor activity. The pressor fraction was termed vasopressin and, pharmaceutically, β -hypophyamine, whilst the other fraction was designated as pitocin and, pharmaceutically, α -hypophyamine.

Anti-Diuretic Action.

In the anæsthetized animal the intravenous injection of pituitrin is followed by an immediate slowing or complete cessation of urinary flow. This important anti-diuretic effect is also seen in the unanæsthetized animal or man, where pituitary extract is able to check the diuresis following the ingestion of large quantities of water. Further experimental evidence of the anti-diuretic effect of pituitrin was obtained by Starling and Eicholz, who studied the urinary excretion when the kidneys were perfused with blood from a heart-lung preparation. After some time the urine became progressively dilute and poor in chlorides. The addition of a small quantity of pituitary extract to the perfusing fluid promptly decreased the volume of urine secreted and increased the concentration of the chlorides.

Although the early evidence strongly suggested a relationship between the condition of *diabetes insipidus* and depressed pituitary function, the present position is by no means clear. It has been shown that many of the symptoms attributed to pituitary dysfunction, such as obesity, abnormal glucose tolerance and polyuria, can be produced by injuring the brain in the vicinity of the *pars tuberalis*. It is not possible in the present article to detail all the evidence for and against the direct influence of the pituitary gland in the regulation of urinary secretion, but I may refer the reader to a detailed account of all the available evidence in "Recent Advances in Endocrinology", Campbell (1934).

Commercially, posterior lobe extracts are issued as pituitrin, either surgical or obstetrical. The former is standardized according to pressor activity by means of comparing its effect on the blood pressure of an anæsthetized dog with that of a standard powder, whilst the latter is standardized by means of the guinea-pig's uterus. In addition,

Parke, Davis & Company supply the two separate principles, known respectively as "Pitocin" and "Pitressin". It is claimed that "Pitocin", containing no pressor activity, is of advantage in cases of threatened eclampsia where there is already a high blood pressure, but apart from this there does not appear to be any condition where the separated principles have any great advantage over the whole lobe preparation.

Melanophore and Capillary Effects.

Krogh was the first to demonstrate that the pituitary had an action on the capillary blood vessels. Studying these in the frog's skin, he found that when the hind limbs were perfused with Ringer's solution, the capillaries lost their normal tone, became relaxed and allowed fluid to pass through, with the result that œdema occurred. Other investigators, Sachs and, independently, Lawrence, noted a marked response of the capillaries of the human skin to pituitary extract. If from one-half to one cubic centimetre of the ordinary commercial posterior lobe extract is injected intravenously into a normal man, a most alarming pallor of the skin ensues. Apparently this reaction is restricted to the skin capillaries, for it is not accompanied by any rise in blood pressure or constitutional symptoms. According to Lawrence this phenomenon of capillary constriction is not seen in diabetic patients. The exact meaning of this is difficult to see, but some connexion between the pituitary and carbohydrate metabolism is suggested.

In addition to the effect on capillary tone, a peculiar action on the melanophore pigment cells in the frog's skin must be mentioned. If the pituitary gland or its posterior lobe be removed from a frog, the skin becomes very pale as a result of contraction of the melanophore cells. The injection of posterior lobe extract rapidly dilates the melanophores and restores the natural skin colour. Dale has indicated the extraordinary activity of this melanophore dilating principle and has quoted Fenn's results, in which it was shown that an extract of one part of whole dried posterior lobe in 10^{10} parts of Ringer's solution was sufficient to cause an effect.

The Relation of the Posterior Lobe to Carbohydrate Metabolism.

The influence exerted by the posterior lobe on carbohydrate metabolism is of an extremely puzzling nature. On the one hand it exhibits a definite inhibitory effect to the hypoglycæmic action of insulin, but somewhat paradoxically also diminishes the hyperglycæmia produced by adrenaline. Burn has studied these actions in detail and has clearly demonstrated the potent effect of pituitrin in relieving insulin hypoglycæmia, and on a basis of this action, pituitrin has a distinct therapeutic value. One still encounters statements to the effect that in order to combat insulin hypoglycæmia, the patient should be given glucose either by mouth or by intravenous injection, either alone

or combined with adrenaline, but from the practical standpoint adrenaline, in cases of severe hypoglycæmia, is not a very efficient agent. Furthermore, it is not always possible to administer glucose by mouth, and the intravenous injection necessitates a carefully prepared sterile solution, which naturally is not always at hand. From my own personal experience I can state that no therapeutic agent can approach pituitrin in combating severe hypoglycæmia. The subcutaneous administration of one cubic centimetre to an unconscious hypoglycæmic patient has a definitely beneficial action from within five to ten minutes. From Lawrence's experiments⁽¹⁾ it would appear that the glucose mobilizing effect of pituitrin is exerted on the liver glycogen, but only in conditions of emergency, such as hypoglycæmia, or in the presence of an excess of insulin. Thus pituitrin administered to a normal human or animal has no significant effect on the blood sugar.

The Anterior Pituitary.

It has been frequently emphasized, and with good reason, that our earliest knowledge of the principles and functions of the anterior pituitary developed from clinical observations. Thus in 1914 Simmons described a disease which now bears his name. Three patients whom he studied were found on *post mortem* examination to have an almost complete destruction of the anterior lobe of the pituitary. To this lesion Simmons attributed the symptoms which were present during life, namely, muscular weakness, loss of weight and sexual dysfunction. More recently many such cases have been carefully studied and Simmons's original observations fully confirmed. In addition to the changes described by Simmons, secondary degeneration of the thyroid, suprarenal and sex glands has been noted. It is apparent that Simmons's disease is closely analogous to the "*cachexia hypophyseopriva*", a term that was applied by Paulesco in 1904 to describe the condition that developed in dogs that had been subjected to hypophysectomy.

Observations of the above type which clearly indicated a relationship between the anterior lobe and human metabolism, suggested the necessity for carefully investigating the effects of hypophysectomy in experimental animals and the possibility of preparing active hormones from the anterior lobe.

For a time there was considerable diversity of opinion as to whether the pituitary was essential for life. It is now apparent that in the earlier experiments the issue was clouded by faulty technique, in that the adjacent brain tissue was injured during the removal of the gland. Recently, however, the operation of hypophysectomy has become specialized and applied to smaller animals, such as rats, guinea-pigs and rabbits, so that we have some very exact evidence concerning the functions of the pituitary. From a survey of the experimental data it would appear that hypophysectomy, although producing a definitely abnormal state, is not incompatible with life.

The Anterior Pituitary and Carbohydrate Metabolism.

The credit of establishing a relationship between the anterior pituitary and carbohydrate metabolism belongs to Houssay and his collaborators. Although such a relationship had been suspected for many years, and Cushing in his researches had indicated that pituitary deficiency was associated with an increased glucose tolerance, it remained for Houssay to produce the first really definite evidence. In the majority of Houssay's investigations dogs were used, and only those who have attempted the operation of hypophysectomy in such animals can appreciate the quality of his technique. By removing either the whole gland or only the posterior lobe, Houssay has been able to discriminate between the functions of the two lobes, and in his opinion the anterior lobe plays an extremely important rôle in the regulation of carbohydrate metabolism. His findings and conclusions may be briefly summarized as follows:

1. Removal of the pituitary gland in dogs renders the animal hypersensitive to the hypoglycæmic action of insulin. In addition, animals from which the hypophysis has been removed, have a tendency to develop severe hypoglycæmic symptoms either spontaneously or after short periods of fasting.

2. Extirpation of the pituitary gland prevents the onset of severe diabetes after removal of the pancreas. It was consistently noted that the glycosuria *et cetera* following pancreatectomy was much less in hypophysectomized animals than in controls or in animals with only the posterior lobe removed. Actually in some instances hypoglycæmic symptoms occurred in hypophysectomized animals after pancreatectomy. Such experiments clearly indicate the rôle played by the anterior lobe, the function of which is further emphasized when we consider that whilst its removal leads to a condition of hypersensitivity to insulin, converse changes can be brought about by the repeated injection of a suitable extract. Thus the injection of such an extract can produce a state of hyperglycæmia and acidosis closely related to true diabetes.

Additional evidence of the influence of the anterior lobe on carbohydrate metabolism was obtained from some very interesting experiments on frogs. Houssay found that total extirpation of the pancreas in a hypophysectomized frog did not produce diabetes. However, if in such an animal the anterior lobe from another animal were implanted, severe diabetes ensued.

Recently, whilst I was working in Sir Henry Dale's laboratory, a number of hypophysectomized rabbits became available for investigations on carbohydrate metabolism. These animals had been operated on by White, who was investigating the relation of the pituitary to the sex and other glands of internal secretion, and the opportunity was taken by Marks and myself of confirming and extending the observations that Houssay had already made on dogs.

Some of the facts described in dogs are very well illustrated by our experiments in hypo-

physectomized rabbits. In the past, many of the facts concerning the actions of insulin and adrenaline have been worked out in a detailed manner on rabbits, so that the effect of hypophysectomy on the actions of these hormones should be clearly seen in this type of animal. In the following experiment the effect of hypophysectomy on response to the hypoglycæmic action of insulin is shown.

A normal rabbit, weighing three kilograms, was taken and food was withheld for twenty-four hours; 0.5 unit of insulin was injected subcutaneously and blood sugar estimations were made at hourly intervals. The initial blood sugar was 98 milligrammes *per centum*; after insulin the readings were 74, 86, 104, 114, 111 milligrammes *per centum*. After hypophysectomy (twelve hours' fast), the initial blood sugar was 98 milligrammes *per centum*. One hour after insulin was given severe hypoglycæmic convulsions ensued, and the blood sugar was 38 milligrammes *per centum*.

It will be observed that in the animal not operated on the lowering of the blood sugar by 0.5 unit of insulin was relatively slight, and that at the end of two hours the normal value had been reached. However, in the animal operated on the same quantity of insulin caused severe hypoglycæmic symptoms within one hour.

In addition to the increased sensitivity to insulin which was exhibited by all our hypophysectomized rabbits, we also noted that it was extremely difficult to recover such animals from a hypoglycæmic state. This is not the case with normal rabbits, for after the onset of hypoglycæmic convulsions, the subsequent injection of a small amount of glucose rapidly restores the animal to a normal state. In many of our hypophysectomized rabbits glucose relieved the hypoglycæmic state temporarily, but relapses occurred and further injections of glucose were required, till finally a stage was reached when neither glucose, adrenaline nor pituitary extract would alleviate the symptoms, and the animal died. In an attempt to explain the action of the anterior lobe of the pituitary gland, Houssay has suggested that it is responsible for the new formation of carbohydrate from non-carbohydrate sources, particularly from endogenous protein and possibly from fat. Now in pancreatic diabetes the cardinal defect is the wasteful formation of carbohydrate from body protein, and if the pituitary is responsible for the formation of carbohydrate from non-carbohydrate sources, it is obvious that pancreatectomy in hypophysectomized animals cannot produce severe diabetes, that is, uncontrolled glucose formation from protein. In support of his theory Houssay has shown that the nitrogen and creatinine excretion is diminished in hypophysectomized animals.

On the basis of Houssay's hypothesis it is easy to explain the exaggerated response hypophysectomized animals exhibit to insulin. We would have to assume that the restoration of the blood sugar from the hypoglycæmic level is brought about by an increased sugar production from protein and fat through the mediation of the pituitary gland. However, before accepting this theory as a complete

explanation of the disturbances in carbohydrate metabolism that follow hypophysectomy, it is necessary to take other factors into consideration. Thus it is well known that when the blood sugar sinks to a hypoglycæmic level, a secretion of adrenaline occurs (Cannon, McIver and Bliss⁽²⁾), and by mobilizing glucose from liver glycogen restores the blood sugar to its normal level. With this phenomenon in mind, together with the fact that hypophysectomy produces degeneration of the suprarenal glands, we must consider the following possibilities when formulating a theory that is to explain the increased sensitivity which hypophysectomized animals show to insulin:

1. That owing to secondary degeneration of the suprarenal glands,¹ insufficient adrenaline is liberated in response to hypoglycæmia.

2. That although sufficient adrenaline is liberated, there is no available glycogen in the liver for transformation to glucose.

3. That although both adrenaline and glycogen are present, the latter, in the absence of the pituitary hormones, cannot be broken down to glucose.

All of these factors have been carefully investigated, and in the investigations of Corkill, White and Marks,⁽³⁾ already quoted, it was shown that the suprarenal medulla of adrenalectomized animals contained normal amounts of adrenaline. In addition, some hypophysectomized animals were actually fed with glucose some time before the injection of insulin. This procedure had no influence in lessening their susceptibility to small and normally non-convulsant doses of insulin. When killed, such animals had in some cases up to 6% of liver glycogen. From such and other experiments, we came to the conclusion that, although glycogen was present in the liver, it was resistant to the mobilizing effect of adrenaline. In some further investigations by Cope and Marks⁽⁴⁾ this view was confirmed, and it was also shown that in hypophysectomized animals a normal outpouring of adrenaline occurred in response to hypoglycæmia. As far as our present knowledge goes, it seems safe to assume that hypophysectomy interferes with those normal mechanisms concerned with the protection of the body from hypoglycæmia. At least two systems are concerned: first, a reactive output of adrenaline from the suprarenal glands which mobilizes glucose from liver glycogen, and, secondly, according to Houssay, the power of the pituitary to accelerate glucose formation from body protein. In the absence of the pituitary, adrenaline is unable adequately to transform glycogen to glucose, whilst in addition neoglucogenesis is depressed. Hence in insulin hypoglycæmia the compensatory mechanisms are ineffectual and the animal progresses to a severe hypoglycæmic state.

In conclusion I should like to mention briefly the relation of the pituitary to fat metabolism. In

¹ Recent investigations have shown that the atrophic changes are confined to the cortical zone.

the past there seemed some very good evidence, on clinical grounds, to associate dysfunction of the pituitary gland with obesity. Recently, however, the evidence seems less certain. In 1921 Camus and Roussy⁽⁵⁾ showed that with an intact pituitary, but with slight injury to the hypothalamic region of the brain, it was possible to produce obesity. This is in keeping with recent experiments on animals, for it is now definite that hypophysectomy unaccompanied by brain injury does not lead to adiposity.

On the other hand, Cushing has described his syndrome of basophilism, in which a small adenoma of the anterior portion of the gland is associated with pathological obesity.

The issue has become still more puzzling since Anselmino and Hoffmann⁽⁶⁾ have published their observations on a fat metabolism hormone. They found that suitable extracts of the anterior lobe, when injected into rats, were capable of increasing the level of the blood acetone bodies. During fasting or after a fatty meal, when acetone bodies appear in the blood, the fat metabolism hormone has been detected and, according to Anselmino and Hoffmann, can be assayed by the rat method. These observations have been fully confirmed, and it now seems definite that we must recognize a hormone from the anterior lobe that is actively concerned with fat metabolism. For the present we cannot satisfactorily explain the relation of the hypothalamic region to obesity, except to suggest vaguely that injury to this portion of the brain interferes with the complex network of nerve fibres that, arising in the hypothalamic region, are distributed over the surface of the pituitary. It has also been suggested that the obesity in Cushing's syndrome is not a direct pituitary effect, but is the result of secondary degeneration of other endocrine glands.

Finally, the question arises as to what therapeutic advances have been made in the treatment of diabetes as a result of the new discoveries on carbohydrate metabolism. Regrettably one has to admit that no advances have been made. No one would seriously suggest that hypophysectomy be carried out in human subjects in an attempt to cure or alleviate the symptoms of diabetes. Some interesting experiments have recently been published by some American investigators. It was noted that injection of the ovarian hormone into animals suppressed the formation of several anterior pituitary hormones, including the diabetogenic principle. Acting on the assumption that the diabetic state is due to a loss of balance between insulin and the diabetogenic hormone of the anterior pituitary, they attempted to suppress the secretion of the latter by administering "Amniotin"¹ to a number of totally depancreatized dogs. Their results showed that this treatment decreased the severity of the diabetes. Naturally one would like to have such results very carefully confirmed before attempting to treat diabetes in the human subject by such means.

¹ An ovarian hormone preparation.

References.

- ⁽¹⁾ R. D. Lawrence and R. F. L. Hewlett: "The Effect of Pituitrin and Insulin on the Blood Sugar", *The British Medical Journal*, May 30, 1925, page 998.
- ⁽²⁾ W. B. Cannon, M. A. McIver and S. W. Bliss: "A Sympathetic and Adrenal Mechanism for Mobilising Sugar in Hypoglycemia", *American Journal of Physiology*, Volume LXIX, 1924, page 46.
- ⁽³⁾ A. B. Corkill, H. P. Marks and W. E. White: "Relation of the Pituitary Gland to Action of Insulin and Adrenaline", *Journal of Physiology*, Volume LXXX, Number 2, 1933, page 193.
- ⁽⁴⁾ O. Cope and H. P. Marks: "Further Experiments on the Relation of the Pituitary Gland to the Action of Insulin and Adrenaline", *Journal of Physiology*, Volume LXXXIII, Number 2, 1933, page 157.
- ⁽⁵⁾ J. Camus and G. Roussy: "Les fonctions attribuées à l'hypophyse: Etude anatomo-pathologique", *Journal de Physiologie et de Pathologie Générale*, Volume XX, 1922, page 535.
- ⁽⁶⁾ K. J. Anselmino and F. Hoffmann: "Das Fettstoffwechselhormon des Hypophysenvorderlappens", *Klinische Wochenschrift*, Volume X, 1931, page 2380.

Reports of Cases.

TREATMENT OF CHRONIC DUODENAL ULCER WITH HISTIDINE.

By K. J. B. DAVIS, M.B., Ch.M. (Sydney),

Tamworth, New South Wales.

FOLLOWING an article appearing in *The British Medical Journal* of July 27, 1935, by Dr. David Smith, of Glasgow, I was tempted to treat a duodenal ulcer by intramuscular injections of histidine, using Hoffmann-La Roche's preparation, "Larostidin". As the results exceeded my expectations, and as it appears that a definite advance has been made, I am submitting a report of the case, and I trust that it will stimulate others to use this preparation and report their results.

Clinical History.

The patient, J.D.McL., aged forty-nine years, a farmer, had suffered from severe symptoms of gastric disorder since his return from the War in 1919, where he was badly gassed with mustard and chlorine gas towards the end of 1918. He was severely blistered over the thorax and in the flexures of the body and was totally blind from the effects of the gas for one month. In 1919 he suffered from pain in the epigastrium and left hypochondrium, accompanied by eructations. These symptoms remained constant throughout the day, but became worse two hours after food, and were temporarily relieved by alkalis. These symptoms persisted from 1927 to October, 1930. He had repeated small attacks of melena, when the pain would be relieved for about two months. During this period he had been taking alkaline powders, and his diet consisted almost exclusively of milk and milk foods. In October, 1930, he had a severe hæmatemesis, which relieved him of all symptoms for two months. From then until July, 1932, he had repeated attacks of pain at one- to two-month intervals, lasting about twenty-four hours, which were followed by small hæmorrhages by the bowel. He then had a second severe hæmatemesis, to which he nearly succumbed. After recovering from this he was sent to Sydney, where he was investigated thoroughly without any ulcer being revealed radiographically, although his fractional test meal revealed a definite hyperchlorhydria. Then followed a period of six months' freedom from symptoms, the patient taking alkaline powders and the restricted diet. From then until August of this year he suffered intermittent attacks of pain, discomfort and eructations at intervals of about three months, with the melena following each attack, but there was no hæmatemesis. When I examined him on August 16, 1935, he had a definite tenderness and rigidity in the right hypochondrium, and in addition a small, inflamed, tender

cervical lymph gland in the suprasternal notch. His circulatory system showed the apex beat in the fifth left intercostal space, inside the nipple line, and his heart sounds and cardiac dullness were normal. The percussion note and respiratory excursion of his thorax were normal, his breath sounds were vesicular, but there were scattered rhonchi, doubtlessly attributable to the chronic bronchitis, which was a sequela to his attack of gas; otherwise his systems were clear. The radiographer's report was as follows: "There is considerable spasm at the pylorus at times, but no definite filling defects seen in *pars pylorica*. The duodenal cap cannot be filled satisfactorily at any stage during the examination. There is a constant filling defect on the right-hand edge of the cap, near its base, but it does not involve the whole of the cap. The stomach, completely empty in two hours' time." The radiographer concludes: "This patient has a chronic duodenal ulcer."

On September 30, 1935, I began the intramuscular injections of "Larostidin", five cubic centimetres daily, suspending all alkaline treatment and allowing him full diet. He remained in hospital for the first week as a precautionary measure, but for the remainder of the time I treated him as an ambulatory patient and he drove his motor car over rough roads daily to my surgery. His progress remained uninterrupted, despite the fact that he nearly fell from a windmill thirty feet high and saved himself only by grasping a portion of the structure as he was falling. This accident had no ill-effects on the experiment, except for a headache. By October 19, although the twenty-five injections had not been completed, he was able to partake of a meal consisting of cold collation, salad, trifle with alcohol in it, and other sweets, and he crowned his indulgence with a large glass of beer and a good nobbler of whisky. He suffered no ill-effects from this, as I was in his company and would have been able to note any eructations should they have occurred. He was delighted, as he had not been able to eat meat for six years. He is now able to work, all symptoms and signs, including the cervical gland, having disappeared, and he expresses himself as feeling fitter than he has for any period since sustaining his attack of gas poisoning. He has gained six pounds in weight. I am aware that "one swallow does not make a summer", but the radiographer's report reads: "The duodenal cap still exhibits a considerable degree of spasm, but can with difficulty be filled completely. The permanent incisura referred to in the last report is no longer present. This stomach shows improvement on when it was done on last occasion, but still shows signs of so-called duodenal irritability." In view of this report I feel certain that this man's improvement is due to treatment with "Larostidin". I intend to give him fortnightly injections for the next two months and then two further monthly injections, when, I hope, "Larostidin" tablets will be available for occasional use.

TWO UNUSUAL ACUTE ABDOMINAL CONDITIONS.

By K. G. LAWRENCE, M.B. (Sydney),
Lismore, New South Wales.

Case I.

On August 5, 1935, at about 10.30 p.m., T.P., a farmer, aged forty-nine years, who had previously been very healthy, walked with difficulty into my surgery. He said that he had been quite well until the evening meal at 7 p.m., when he felt a bit "off colour", but had managed to eat some stew and then had gone to bed. At 8 p.m. he had had severe pains all over his abdomen and had vomited. (Other members of the family were unaffected by the meal.) The pains persisted, but there was no further vomiting, and finally he got a friend to drive him into town (eight miles) by motor car. His bowels had not acted since that morning and he had no urinary or respiratory symptoms. He gave an indefinite history of

indigestion in the form of intermittent attacks of "wind" after food for some months.

On examination he was a tall, healthy-looking, "wiry" man. His temperature was 36.1° C. (97° F.), his pulse rate was 80, and his respiratory rate 20 in the minute. The abdomen was slightly distended in the lower half. He complained of generalized tenderness, the point of maximum intensity being on the right side, on a level with the umbilicus, about 3.75 centimetres (one and a half inches) from the mid-line. There was some rigidity of his upper recti muscles. He was shivering and appeared shocked, so was sent to hospital immediately. Seen again about 11.30 p.m. he seemed to be a little more comfortable. His temperature was 36.5° C. (97.8° F.), his pulse rate was 80, and his respiratory rate 20 in the minute.

The signs were much the same as before, except that the rigidity of the upper recti muscles appeared more pronounced and the point of maximum tenderness was more in the region of McBurney's point. A provisional diagnosis of acute appendicitis was made, but in view of the rather unusual signs, the subnormal temperature, and the fact that the patient was feeling more comfortable, it was decided to wait for a time in the hope that the attack would settle down.

By 12.30 a.m., however, the colicky pains had returned with increased intensity and the temperature had risen to 37.6° C. (99.8° F.) and the pulse rate was 82 in the minute. His abdomen was more distended and the rigidity was more marked, though still not very definite in the lower half of the abdomen. Operation was decided upon.

When the patient was anaesthetized a mass could be seen and felt high up in the right iliac fossa, so a grid-iron incision was made over the mass. After the omentum forming the mass had been delivered, some purulent fluid escaped and a loop of small bowel was delivered containing a foreign body. This latter proved to be a rib bone of a fish (black bream) about 3.1 centimetres (one and a quarter inches) long. It was jammed transversely across the bowel and causing a partial obstruction to the bowel contents above it. The "blunt" end of the bone had perforated the bowel at the mesenteric border, and through this perforation some of the bowel contents had leaked. The bone was removed through the perforation and the hole was closed with a purse-string suture. As much fluid as could be was sucked out of the abdominal cavity and a large drainage tube was placed through the wound into the pelvis. Ten thousand units of Commonwealth Serum Laboratories gas gangrene antiserum were administered.

After the second day the convalescence was uneventful and the patient was allowed up on the fourteenth day and discharged on the sixteenth. Questioned afterwards, he stated that he had eaten fish on the evening of August 4, 1935, and again for breakfast on the morning of August 5, 1935, but had no recollection of swallowing any bones.

Case II.

B.D., a Hindu boy of four years, was brought to my surgery about 8.45 p.m. one evening. The father stated that the boy had partaken of stew with the rest of the family at about 6 p.m. and had then gone to bed and to sleep. He awoke at about 8 p.m., crying with severe abdominal pain, and vomited. He had been crying with pain ever since. Shortly after he woke his bowels were open and the motion was soft. He had passed fairly loose motions three or four times on the two preceding nights, but had not complained of any pain.

On examination his temperature was 38.5° C. (101.4° F.), his pulse rate was 140 and his respirations numbered 26 in the minute. His abdomen was distended, with generalized tenderness, most marked over McBurney's point. Heart, lungs and urine were normal.

A provisional diagnosis of acute appendicitis was made. At operation the appendix was found to be acutely inflamed, round worms could be felt in the caecum, and one of the worms could be traced to the base of the appendix, into which it appeared to be firmly jammed. The appendix was removed and the patient's convalescence was uneventful. During convalescence two round worms were recovered.

Reviews.

THE BIOCHEMICAL EXAMINATION OF THE INDIVIDUAL.

OBERMER and his colleagues have attempted the difficult task of assessing the "functional efficiency" of the individual. In the present volume, "Individual Health", Volume I, "Biochemical Technique",¹ Obermer and Milton discuss the biochemical part of the technique involved in conducting a full examination of an individual. It is intended to present, in future volumes, the technique for physical, radiological, dental, nervous, circulatory and other examinations, and the interpretation of the findings.

The authors state:

Only by an exhaustive study of each individual will it be possible to arrive at an understanding of the part played by all those environmental factors, both physical and psychological, which hinder or promote efficiency, resistance to infection, and longevity without senile loss of elasticity The efficiency with which an individual adapts him or herself to the stress and strain of growth, reproduction, and the struggle for livelihood or power, is the measure of his functional efficiency throughout life The basic purpose of a complete investigation of individual functional efficiency is to permit of a periodical, routine, prophylactic investigation with the object of: (a) Detecting the very earliest signs of dysfunction, strain and lowered resistance before disease or irremediable organic changes have supervened. (b) Raising the standard of individual well-being, or health, by advice or treatment based in each case upon the quantitative assessment of functional efficiency.

Unfortunately, the authors devote little space to discussion of the objectives of the detailed study made on each individual. The comprehensiveness of this study is indicated by the fact that the eighty-seven analyses described in the text are considered by the authors to represent the minimum number necessary for each examination. These comprise nineteen chemical and seven physico-chemical analyses on blood, five on ingesta, twenty-five on urine, eight on faeces, and six analyses for mineral constituents on samples of blood, ingesta, urine and faeces. To these must be added the physical examinations, taking of history and personal information *et cetera*. Probably few laboratories will possess sufficient available technical assistance to enable such a routine study to be made on single individuals.

To the biochemist engaged in research of usual character the book will prove of little value. Those engaged in clinical work may possibly gain some benefit by reading of the "mass production" technique for obtaining the data, and of the numerous modifications consequently made in standard procedures. To the average medical practitioner the book has little to offer.

A majority of the numerous analytical methods detailed are colorimetric procedures, in which the colorimeter has been replaced by the authors' "densitometer". This is virtually an electrophotometer employing a single photo-electric cell. It is doubtful whether this modification will meet with general approval. One is forced to the conclusion that, in many of the methods, accuracy has been sacrificed to speed—a fact which will detract from the value of the book to most research workers, although, as the authors remark, it has been necessary to reduce the time factor to enable such a large series of analyses to be performed on each subject. In combination with the projected future volumes, this book may gain a new significance; alone, it is unlikely to prove a useful addition to medical literature.

¹ "Individual Health: A Technique for the Study of Individual Constitution and its Application to Health", by E. Obermer; Volume I: Biochemical Technique, by E. Obermer and R. Milton; 1935. London: Chapman and Hall, Limited. Demy 8vo, pp. 260, with illustrations. Price: 15s. net.

PHYSIOLOGY.

LEONARD HILL's "Manual of Human Physiology" has now reached its fourth edition and may be grouped with the earlier hand-books of Foster and Shore, and of Huxley, as a classic among the elementary works on physiology.

The book has undergone little change since it first appeared in 1907. Indeed it has required surprisingly little alteration. This is a tribute to the soundness of the author's judgement in his presentation of the elements of the subject. Or have the advances in physiology during the last thirty years been largely in matters of detail?

The principal difference from earlier editions lies in the rearrangement of the introductory chapter, with the excision or relegation to the appendix of the discussion of certain elementary ideas of physics and chemistry. A chapter on reproduction has been added. The absence of a section on this subject can no longer be excused, even in an elementary manual of physiology.

The book is profusely illustrated. Some of the illustrations have been redrawn. A few of the rest have lost enough of their pristine sharpness to need redrawing. Clearness is important to readers who are perhaps getting their first introduction to the objects illustrated.

A few anachronisms remain. The word "proteid" has escaped the eye of the reviser in several places. The obsolete term "reduced alkali hæmatin" is used for hæmochromogen. And surely, when a table of metric equivalents is in the book, the volumes of the blood gases need not be discussed in pints.

On page 118 the foot is described as a lever giving a mechanical advantage to the muscles attached to the *tendo calcaneus*. Actually the reverse is the fact. This is a common mistake in text-books of physiology. The point is not merely of academic interest. It means, for example, that when one stands on tiptoe on one foot the pull exerted by this muscle is not less than the weight of the body, but some four times this weight. The fallacy that proteins and polysaccharides may be absorbed from the rectum is perpetuated on page 270.

The book still retains its proven value for the class of readers for whom it was designed. It places before those approaching the subject for the first time an interesting, comprehensive, and well balanced outline of human physiology.

Notes on Books, Current Journals and New Appliances.

THE "MEDICAL ANNUAL" INDEX.

For many years the "Medical Annual" has been a reliable guide regarding the progress made in medical knowledge. We have repeatedly urged medical practitioners to make use of this publication as a book of reference. Its value has recently been enhanced by the publication of a general index covering the ten years 1925-1934.¹ No subscriber to the "Medical Annual" should be without this index, for with it by his side he will be able to find a short and authoritative *résumé* of recent advances in medicine. In the "Medical Annual" particular emphasis is laid on the practical application of knowledge—the subtitle is "A Year Book of Treatment and Practitioner's Index". The present volume contains an interesting summary of the most important work done during the last ten years. The articles in this summary have been written by the usual contributors to the publication.

¹ "Manual of Human Physiology", by Sir Leonard Hill, M.B., LL.D., F.R.S., Hon. A.R.I.A.; Fourth Edition; 1935. London: Edward Arnold and Company. Crown 8vo, pp. 482, with illustrations. Price: 6s. 6d. net.

² "The Medical Annual General Index and Review for the Ten Years 1925 to 1934; Volume V; 1935. Bristol: John Wright and Sons, Limited. Demy 8vo, pp. 466. Price: 12s. 6d. net.

The Medical Journal of Australia

SATURDAY, FEBRUARY 1, 1936.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction, are invited to seek the advice of the Editor.

NUTRITION.

THE Medical Section of the Queensland Branch of the British Medical Association has in the papers published in this issue directed the attention of Australian practitioners to a most important subject. "Diet and Disease in Childhood", "Diet and Disease in Later Life", "Diet and Disease of the Eye", "The Endocrine Glands and Nutrition" have been considered, and Dr. N. M. Gutteridge has made some suggestions for reform. The writers of these papers have had before their minds two distinct and essential points of view: they have considered the food taken into the body and also the body itself as influenced by its endocrine glands. In commending the Queensland contributions to the attention of readers, we would suggest that they be read in conjunction with the paper on obesity by Professor G. C. Lambie, published in this journal on December 7, 1935. Further, a valuable discussion on nutrition and the public health by Et. Burnet and W. R. Aykroyd, and issued by the League of Nations, will be found in the June, 1935, issue of the *Quarterly Bulletin of the Health Organization*.

The student of nutrition must realize at the outset that the terms "state of nutrition" and "malnutrition" have, as pointed out by Burnet and

Aykroyd, different meanings for different authorities. Sir George Newman connects the term nutrition with the "total well-being and right functioning of the whole body". Others give the term "state of nutrition" a more restricted meaning. Thus the German word *Ernährungszustand* refers solely to the amount of fleshy covering that envelopes the skeleton. Children with a good or bad *Ernährungszustand* are thus fat and thin children respectively. If the student of the subject knows what he means by a good state of nutrition, he is at once faced with an insuperable difficulty in that he is unable to lay down precise normal standards of health and physical development. There are many types of individual, and, even if it were possible to classify all persons into different groups, the difficulty would not be less. Burnet and Aykroyd point out that difficulties increase when the normality of large numbers of persons has to be determined. If decisions are based on averages, the standard may be "subnormal relatively to the optimum or ideal state that might be conceivable". They mention three methods of assessing the nutrition. The first is the comparison of certain measurements (or the relation between certain measurements) with a chosen standard. The second is the formulation of a general clinical impression of the state of health and development. The third method is the use of more refined clinical tests designed (a) to assess physiological efficiency and (b) to detect early deficiency disease. In regard to the third method, it is interesting to consider the magnitude of the task. The authors of a recent book on biochemical technique in estimating the health of the individual, described no less than eighty-seven analyses which in their opinion represented the minimum number necessary for each examination. Dr. Arthur MacNalty, Chief Medical Officer of the Ministry of Health of Great Britain, in his report for the year 1934, states that at present the only practicable mode of approach to the problem of the state of nutrition of individuals is by clinical examination in which reliance is placed almost entirely on the expression, appearance and stance of the individual. He follows this declaration by a statement which is obvious, but which

nevertheless needs emphasis, that the accuracy of assessment depends on the ability and experience of the physician.

The diet of mankind varies enormously according to economic and geographical circumstances. Climate and custom determine dietary habits to a large extent, and the growth of industrialism with the concentration of many people in large cities has brought about many changes in food habits and in certain places in the ability of people to buy food. The crowded countries of Europe and the East present problems that are without parallel in Australia. Much progress in the knowledge of food requirements has been made; the articles appearing in this issue show this quite clearly. But much more remains to be done. In this regard a section of Dr. MacNalty's report may be quoted:

Only when knowledge of food chemistry and of physiology has advanced to such a stage as to make it possible to state the amounts of the 20 or so essential nutrients in foods used for human consumption and the requirements for health, will one be able to place an exact value on human diets. It will be a long time before this is possible at the present rate of progress. In regard to vitamins, not only have the amounts present in foods and the requirements of the human organism yet to be ascertained, but some of them have yet to be isolated in pure form and chemical methods of analysis have to be devised.

Available knowledge must be used. This does not mean that concentrated vitamins are to be added to food in a haphazard fashion, but, as Dr. Gutteridge points out, that an effort should be made to give a balanced diet. Australia, in view of its abundant sunlight and its relatively favourable economic conditions, is not extensively affected either by malnutrition or pronounced deficiency disease. In this regard it is of interest to recall a recent conference of medical men and women called by the Lord Mayor of Sydney and held under the chairmanship of the President of the New South Wales Branch of the British Medical Association. This conference met to inquire into malnutrition among the children of the metropolitan area of Sydney. It was pointed out that pronounced rickets was practically unknown in Sydney, and that ample provision was made for the supply of suitable food to the indigent. At the present time medical practitioners have the power to supplement the diet of

relief workers and others who are in receipt of assistance from the State by ordering fresh fruit, milk, eggs and so forth. During recent months the need for orders of this kind has become much less. While there may be no evidence of gross malnutrition, the food of many people is doubtless ill-balanced, as in the boarding schools in Brisbane mentioned by Dr. Gutteridge. It is here that medical practitioners will have opportunities of achieving results. At the same time, what is wanted is research. This must be of two kinds. In the first place the statistical evidence referred to by Dr. Gutteridge should be collected; this collection could be initiated by the Federal Council of the British Medical Association in Australia. In the second place, some effort should be made to determine physical and health standards for Australians. It would need to be a nation-wide research, for Australia has many different climates and conditions within its borders, and findings of one part could not be applied to all parts of the continent. This research was urged by the Lord Mayor's conference in Sydney; it is the kind of research that should be undertaken by an Australian National Medical Research Council. It might be said with truth that the problems of nutrition are alone sufficient to justify the formation of this long overdue body.

Current Comment.

EXPERIMENTAL CHOLESTEROL ARTERIOSCLEROSIS.

ARTERIAL lesions which resemble those of human arteriosclerosis can be produced in rabbits by the administration of diets containing considerable quantities of cholesterol. These lesions are characterized by a thickening of the intima and by abundant accumulations of lipoids in the intima and in the inner layer of the media.

The picture resembles that of human arteriosclerosis very closely, but is not identical with it. A complete and exact reproduction of human arteriosclerosis in animals has not yet been obtained. In spite of this, the rabbit experiments have aroused great interest, and many authors have assumed that this "experimental cholesterol arteriosclerosis", as Duff has called it, is identical with human arteriosclerosis, and have laid great emphasis on hypercholesteræmia as a factor of primary significance in the causation of human arteriosclerosis. Inferences regarding human arterio-

sclerosis have been drawn with the greatest abandon from experimental data which actually prove nothing more than the probability that hypercholesteremia is essential to the development of experimental cholesterol arteriosclerosis in rabbits. In an excellent general review of experimental cholesterol arteriosclerosis and its relationship to human arteriosclerosis, G. Lyman Duff¹ deprecates the unreserved acceptance of this experimental work on rabbits as evidence capable of direct application in the human being.

Duff shows, to begin with, that the disease produced in rabbits is not identical with human arteriosclerosis. There are, for instance, striking divergences in distribution, the most notable of which is that the cerebral and retinal arteries are never involved in the rabbit. Other important differences are of such a nature as to suggest strongly that the lipoids of the plasma play a much more important part in the rabbit than in man. In the rabbit, lipoids accumulate in the cells of the suprarenal cortex, in the liver cells and in the cells of the reticulo-endothelial system. This does not occur in human arteriosclerosis. The picture in the rabbit shows a saturation of the whole body with lipoids, while in human arteriosclerosis the rôle of the lipoids is confined exclusively to their accumulation in the arterial walls. Next, it must be remembered that the normal food of the rabbit is very different from that of man. The rabbit is a herbivorous animal and cholesterol is completely lacking in its diet, while man is omnivorous and human diets contain varying quantities of cholesterol. The normal blood cholesterol in rabbits is far below—approximately half—that found in man. The addition of cholesterol to the rabbit's diet produces hypercholesteremia. In the human being the addition of cholesterol to the food of normal subjects does not produce a sustained hypercholesteremia; the effect on the blood cholesterol is relatively slight and transitory. Moreover, and in spite of the differences in the cholesterol content of the diets of different persons and of different races, it has never been shown that those persons or races which subsist on diets poor in cholesterol are by any means protected against the development of arteriosclerosis. Nor has it been shown that persons or races which develop arteriosclerosis at an earlier age or in more severe degree than others are addicted to foods which are rich in cholesterol.

Again, the results of feeding experiments in animals other than the rabbit cannot be overlooked. It is especially important to bear in mind that animals such as cats and dogs which, like man, fail to manifest pronounced hypercholesteremia following cholesterol feeding, do not show any changes in their arteries after prolonged feeding on diets rich in cholesterol. "The uniform failure of all attempts to produce arterial lesions by this method in cats, dogs, foxes and monkeys speaks strongly against the idea that cholesterol in the diet is a

factor of any importance in the etiology of human arteriosclerosis. The negative results obtained in these animals seem more properly applicable to the human being than do the positive results obtained in rabbits."

Lyman Duff's review is an excellent piece of scientific criticism. Trained as we are in the belief that every effect has its cause, we are too apt to imagine that the causes of disease are just waiting to be found, and that the interpretation of scientific research is an easy matter. The aim of modern medicine is the prevention of disease, and the civilized world is eager to know how the maladies that beset it may be avoided. The ardent desire to know the cause of things is apt to outrun reason. Too often it leads to a too enthusiastic and zealous faith in the validity of experimental results, and to the blind acceptance of conclusions which may be quite misleading. It is an extremely difficult matter to plan research from which valid conclusions can be drawn, to eliminate fallacies and to reject false conclusions. It requires the impartiality of a judge, the accuracy of a mathematician, the patience of Job and the training of a statistician. The amount of experimental work published is so immense that we are deeply indebted to interpreters such as the writer of this review. He is, as it were, a surveyor who maps out the actual achievements of explorers in this field. He applies to the known facts "those high investigations of reason" which Kant said were more important than all that can be discovered within the domain of phenomena. His criticism is largely, but not entirely, destructive. He suggests plans for future work. "We should", he writes, "select for experimentation an animal species which is closely related to man and which is naturally subject to the development of a type of spontaneous 'old age' arteriosclerosis. The obvious aim, then, would be to produce prematurely in such an animal lesions of the arteries of a character corresponding with its own type of spontaneous arteriosclerosis. . . . The necessity of preliminary local alterations in the walls of vessels as a factor indispensable to the precipitation of lipoids and to the subsequent development of human arteriosclerosis is perfectly clear, and there is every reason to believe that injury to the walls of the arteries can produce these changes."

The question of the real cause of the primary injury to the arteries in experimental cholesterol arteriosclerosis has never been investigated, and still presents itself as the most important problem in the ætiology of human arteriosclerosis. The cholesterol feeding experiments provide no valid reason for believing that a disturbance of cholesterol or lipid metabolism plays any part in the causation of human arteriosclerosis. There is no definite or concrete evidence from observations on human beings to support the idea. If a disturbance of lipid metabolism participates in the ætiology of arteriosclerosis in man, the fact remains to be demonstrated in the future; it has certainly not been proved by recent experiments.

¹ *Archives of Pathology*, July and August, 1935.

Abstracts from Current Medical Literature.

SURGERY.

Intracranial Pressure in Head Injuries.

ARTHUR A. ZIEROLD (*Archives of Surgery*, November, 1935) comments upon the occurrence of abnormal intracranial pressure with cerebral trauma and its relation to the cerebral symptoms, deriving his data from the study of one hundred and twenty-eight cases, in each of which unconsciousness was present for at least one hour. In severe head injuries abnormal intracranial pressure is not a frequent occurrence, and only in a small percentage of cases will it exceed 300 millimetres. Abnormal pressure is not a frequent finding in the fatal cases, nor is it a frequent cause of death; unless the abnormal pressure develops rapidly and is of sufficient degree to approximate to the blood pressure, changes in blood pressure and pulse rate do not occur, and such changes cannot be considered as satisfactory evidence of abnormal pressure. Unconsciousness is not in itself evidence of abnormal intracranial pressure, nor is the period of unconsciousness a measure of the degree of intracranial pressure. When abnormal intracranial pressure occurs, it is the result of hemorrhage, extradural, subdural or within the substance of the brain, and is almost invariably attended by blood in the spinal fluid. It is not probable that abnormal intracranial pressure of a degree to endanger life is susceptible to treatment by spinal drainage or by the use of hypertonic solutions; it would appear reasonable to treat these cases by surgical methods.

Lymphatic Spread in Cancer of the Rectum.

ACKNOWLEDGING that in cancer of the rectum treated by radical excision the prognosis depends to a large extent on the presence or otherwise of metastasis in the lymph glands, W. B. Gabriel, C. Dukes and H. J. R. Bussey (*The British Journal of Surgery*, October, 1935) record their conclusions drawn from the combined study of a number of cases at Saint Mark's Hospital. The follow-up records show that when the growth is removed by perineal resection before there is any gross extension to the perirectal tissues, 91% of those who survive operation are alive after five years; when the growth has extended by direct spread to the perirectal tissues, but has not caused deposits in the gland, 64% of patients survive for five years; when glandular metastases are present, only 16% of patients survive the five year period. A special method of studying the specimens is described. During the investigations it was proved that

while over one-half of the cases showed glandular metastases, rarely were more than two or three glands involved. Since a surgeon is inclined to be so much influenced by the discovery of enlarged glands, it is important to note that conjectures with respect to metastases in the rectal, hæmorrhoidal or paracolic glands are more often wrong than right, the commonest source of error being the presumption that the glands contain metastases which are enlarged as a result of inflammation. The spread is from gland to gland, usually in orderly fashion, commencing in the perirectal tissues on the same level or just above the growth; the next to be affected are the chain of glands accompanying the superior hæmorrhoidal vessels, in sequence from below upwards, extending in advanced cases to the site of ligature of the inferior mesenteric vessels. Lymphatic extension to the paracolic glands is due to blockage of the normal lymph stream by metastatic deposits, but by the time this has occurred it is unlikely that the disease can be eradicated by surgical excision. It is suggested that if the examination of the specimens is made in the manner described, a much more accurate prognosis may be obtained, especially for those cases in which the metastases are found in the lymph glands.

Intestinal Obstruction by Gall-Stones.

C. P. G. WAKELEY AND F. W. WILLWAY (*The British Journal of Surgery*, October, 1935) discuss intestinal obstruction by gall-stones and report a number of cases. It is pointed out that while intestinal obstruction due to factors such as faecal accumulations, carcinoma or peritoneal bands will show a varying incidence, that due to gall-stone impaction will never become very infrequent, as so many cases of gall-stones are symptomatic. Recent statistics reveal that between 1% and 2% of all obstructions are due to impacted gall-stones, while earlier reports indicated a higher incidence; this difference may be associated with the modern preference for cholecystectomy. The average age of patients is over sixty-five years, females predominate, and the mortality rate is about 25%. The high mortality rate is partly explained by the ages and general condition of the patients, and by the fact that operation is usually delayed as the obstructions appear frequently to be intermittent. Only one-half the patients present any history referable to the gall-bladder. The commonest site for impaction is the terminal part of the ileum. The possibility of multiple stones must always be remembered, and an appropriate search is indicated. The great majority of these stones reach the alimentary tract by ulceration through the wall of the duodenum; other rarer routes are recorded, namely, stomach, colon; others leave no indication of the route. After passage of the stones, the fistulous track may close down to very

small proportions, resembling even adhesions, and a note of warning is sounded by the statement that when cholecystectomy is being done after gall-stone obstruction an apparently innocent adhesion may be a cystoduodenal fistula. When the operation for relief of obstruction is being done on debilitated subjects, it is suggested that the affected loop of bowel should be exteriorized rather than that any attempt should be made to do more extensive operations. In conclusion, detailed reports and illustrations from eleven cases are recorded.

Pilonidal Sinus.

H. ROGERS AND M. G. HALL (*Archives of Surgery*, November, 1935) record their impressions derived from a study of a very large number of the pilonidal sinuses and present suggestions for an improved treatment. The pathological tissues were examined and the following comments are derived therefrom. The pre-operative injection of dyes into the tracts is probably contraindicated because the actual sinus tract is not always filled, and particles of the dye are forced into normal tissues, leading to more extensive operations than are necessary; methylene blue solutions have no advantage over Indian ink, as the fluid will stain normal tissues, and there is no possibility of controlling the pressure by which the dye is introduced as no pre-operative determination of the thickness and permeability of the walls of the tract is possible. The majority of these sinuses are mid-line tubular structures, and in these cases it would have sufficed to have excised a block of tissue two centimetres wide; the length as determined by the number of openings, would have been adequate had the dissections started at a point one centimetre below the lower opening and extended to a point five centimetres above a single opening and not over one centimetre above the uppermost of multiple openings. When lateral openings were present, incisions not more than 0.5 centimetre outside them would have sufficed. From this study it seems probable that the lateral extensions are all formed by infection, the accessory openings, by their appearance as well as by their clinical history, suggesting an origin from rupture of infected tissue from below. It seems probable that before any abscess forms, the pilonidal sinus is a simple tract with never more than one or two closely associated sinus openings. The study of specimens from the secondary resections suggests that the recurrence or persistence of symptoms is probably due to the retention of infected tissues or to faulty healing, which causes the formation of an infected dead space. The impression that recurrence is always due to growth of the retained tract or its accompanying structures, the follicles and sebaceous glands, is not substantiated, as it has not been found possible to demonstrate that epithelial elements left behind at previous

operations undergo any changes except those incident to infections. From this investigation the authors conclude that it is logical to scrap the "radical operation" with its attendant economic loss, and to make the dissection as small as possible in order to insure good healing, and to rely on the surgeon's ability to recognize diseased tissue in a field which is not obscured by excessive bleeding or by dyes. In conclusion the authors submit details of a method of treatment by repeated excisions with the cautery of diseased tissue only, carried out as minor operations on ambulatory patients.

Toxic Adenoma of the Thyroid Gland with Associated Hypothyroidism.

H. H. SEARLS (*The Western Journal of Surgery, Obstetrics and Gynecology*, September, 1935) remarks on the frequency of the association of the toxic signs and symptoms associated with nodular goitre coexisting with the classical evidence of hypothyroidism. Commonly the basal metabolic rate is found to be normal or subnormal. Records of lowered basal metabolic rates in patients suffering from toxic nodular goitre are frequent in the literature. If clinical evidence of toxic goitre is present, the basal metabolic rate should be entirely disregarded. Even when auricular fibrillation and decompensation appear, the basal metabolic rate may be unaltered. The author reports a patient with extreme toxic symptoms who had a basal metabolic rate of -4. Excision of the adenomatous goitre and administration of thyroid substance have greatly improved her condition.

The Jaundiced Patient.

ISIDORE COHN (*The American Journal of Surgery*, November, 1935) discusses the reasons for mortality in operations upon jaundiced patients, and stresses the futility of certain accepted formulae concerning jaundice. A plea is made for more extensive biochemical studies of jaundiced patients. Virchow in 1847 suggested that bilirubin was formed from hæmoglobin. We now know that it is formed in organs other than the liver. It is now generally accepted that bile pigment is formed by the reticulo-endothelial structure, while bile salts are formed only in the liver. Hence, if bile pigments are excessive in the blood, the jaundice may have an extra-hepatic origin. Van den Bergh has enabled a distinction to be drawn between the jaundice of hepatic and that of non-hepatic origin. Much information may be gleaned from the icterus index, the Van den Bergh test, the cholesterol and blood fat. Surgery in the jaundiced patient has always carried a high mortality. Recent statistics covering more than 36,000 cases showed an average mortality of 6.6%. Jaundice prolongs the coagulation time of the blood, thus increasing

the tendency to hæmorrhage. However, the author casts doubt on the logic of the use of calcium salts for this condition, for no evidence has been adduced that calcium salts are lacking. Blood chemistry is too little understood by most surgeons. Frequently blood urea may be doubled by the second or third day after an ether anæsthetic. Every effort should be made to determine the cause of the jaundice prior to operation. Hæmolytic jaundice is more common than was formerly thought. Its cure by splenectomy is spectacular. It is recognized by the increased fragility of red blood cells and the indirect Van den Bergh reaction. Contrary to accepted belief, progressive painless jaundice need not be diagnostic of malignant disease. The author summarizes histories of some patients in support of his statement. Jaundice associated with pain is not necessarily indicative of stone in the common duct. While Courvoisier's law frequently holds true, there are many contradictory findings. The author records four instances in which the appendix was adherent to the duodenum, causing obstruction to biliary drainage and consequent jaundice. Carcinoma of the pancreas may be exceedingly painful, and the cause of the patient's seeking advice apart from the associated jaundice. The jaundiced patient should not be refused operation on the suspicion that malignant disease is the cause of painless jaundice.

Cervical Ribs.

AFTER reporting the clinical history of a female patient who suffered from a right-sided cervical rib, Louis P. Kasman and William Bernstein (*The American Journal of Surgery*, November, 1935) give an historical survey of the condition. Galen and Vesalius first described the anomaly. Crooke, in his book which was published in 1651, gives a description of a cadaver found to possess 13 ribs on each side. In 1849 Gruber collected 76 cases and classified them into four groups according to their size, attachments and articulations. This classification is still used. In 1861 Coote performed the first operation for the relief of symptoms on a female patient twenty-six years old. By 1907 Keen was able to find records of 43 operations. Up to the present time the literature contains records of over 800. The abnormality is far commoner in females in the proportion of approximately two to one. If only one cervical rib is present, it is more often present on the left side, although symptoms are more frequent when it occurs on the right side, possibly because of a greater drop of the right shoulder in most people. Adson and Coffey consider that compression of the subclavian artery and brachial plexus is caused by the *scalenus anterior* muscle against the rib or its tendinous attachment. Two cervical ribs on the same side are extremely rare, only

three records occurring in the literature. Many authorities believe that symptoms are caused by direct pressure of the cervical rib on the anterior surface of the subclavian artery and brachial plexus. Adson and Coffey maintain that the mere section of the *anterior scalenus* muscle is sufficient to remove all symptoms. The size and shape of the rib can give no indication of the severity of the symptoms caused. The authors' patient was relieved of all symptoms following upon excision of the offending rib.

Putrid Abscess of the Lung Following Dental Operations.

LEO STERN (*The Journal of Thoracic Surgery*, August, 1935) reports twelve cases of massive lung abscess following upon dental extractions. In eight cases the abscess was a sequel of extractions under local anæsthesia. In none of the twelve was there evidence of the aspiration of any portion of the tooth. Approximately 25% of all pulmonary abscesses occur following upon operations in the mouth or throat. It is generally assumed that infection may reach the lungs by direct aspiration or by medium of the blood stream. The author favours the former as being the more frequent. He holds this opinion because of the ease with which material may be aspirated, the bacteriological findings similar to those of pyorrhea, the presence of a large single abscess as opposed to the small abscesses of pyæmia, and the rarity of associated infarcts. Examination of the bronchi after tonsillectomy in children has disclosed the presence of blood below the vocal cords in 76% of cases. Tonsillectomy under local anæsthesia in adults has been followed by the presence of blood in the larynx and trachea in 20% of cases. The author lays stress on the prevailing lack of oral hygiene at the time when operation is usually performed. Some commonly employed nerve block injections cause a dulling of the pharyngeal reflex, and may allow of aspiration of foreign material. Symptoms usually develop in a definite sequence. There is a definite period of incubation followed by feverishness and chilliness; these are followed by a pain in the chest associated with a cough. There is a foul odour on coughing, which suddenly yields pus on the tenth or twelfth day from the onset. Preventive measures should aim at obviating aspiration. Fragments of tartar dislodged from the teeth during operation are the most probable source of trouble. Anaerobes are common causative agents. A meticulous toilet of the mouth should be insisted upon before operation. A minimum amount of "Novocain" should be injected, and hypnotics should be avoided on the first day after operation. A follow-up system should be included in every dental clinic, so that the true proclivity to lung abscess may be estimated.

British Medical Association News.

SCIENTIFIC.

A MEETING of the Queensland Branch of the British Medical Association was held at the B.M.A. Building, Adelaide Street, Brisbane, on November 1, 1935, Dr. ALEX. MURPHY in the chair.

Nutrition.

Dr. H. R. MATHEWSON said that in accepting the Council's invitation to provide a subject for discussion at the meeting, the members of the Medical Section were unanimously of the opinion that the problem of nutrition was one that merited the attention and interest of all members of the Branch.

As those present were aware, for a number of years past investigators in all parts of the world had been devoting a great deal of attention to the subject. While man in his struggle for existence had been capable of modifying his environment in various directions and to this extent of achieving independence, the requirements of his body as a living organism remained what they were when he lived in his primitive state. Those who had studied the habits of native races, had observed signs of physical deterioration after the natives had relinquished their hunting habits. Everyone knew that if food lacking certain ingredients was fed to animals, disease followed. Disease was avoided not merely by supplying these ingredients; they must be provided in a natural form and combination. It was depressing to read the story of those early navigators who, venturing forth in search of new lands, had been stricken down by disease. Habits of eating were almost universally simple and natural until about the nineteenth century. With the advent of industrialism, towns began to grow up and industrial centres to develop. This interfered with the cultivation of the land, and food had to be transported over longer distances. Gradually the consumer became further removed from the source of production. Later on, food supply fell into the hands of the industrialist and the consumer was compelled to eat foods which the industrialist chose to supply. The result was that the use of the more bulky forms, such as fresh vegetables and fruit, became diminished. Methods of food preservation came to be introduced and food was canned. In order to make food appear more attractive and for other reasons, it was subjected to certain processes, both mechanical and chemical, which deprived it of many of its most nutritious properties—the bran and the germ were removed from the wheat, the flour was bleached, yeast was replaced by baking powder. Within recent years investigators had brought under notice the importance of food residues. They heard, for example, of the value of an alkaline ash diet. Most of the opening speakers would deal with the question of diet in relation to nutrition, but at least one would speak of the part played by the body itself, which he would illustrate by reference to the influence of the endocrine glands.

In the fifteen minutes allotted to him, each speaker would draw the attention of those present to some aspects of the subject of nutrition which, as the result of his own observation and experience, he had come to regard as important in the prevention and cure of disease.

Dr. P. A. EARNSHAW read a paper entitled: "Diet and Disease in Childhood" (see page 153).

Dr. CLIVE SIPPE read a paper entitled: "Diet and Disease in Later Life" (see page 156).

Dr. E. O. MARKS read a paper entitled: "Diet and Disease of the Eye" (see page 157).

Dr. S. F. McDONALD, in a paper dealing with endocrine disorders and nutrition, began by saying that the body might be given a theoretically perfect diet, but if certain factors necessary to the proper functioning of the body were lacking, then it could not make full use of the food supplied. He said that he proposed to discuss briefly the

work of the endocrine glands in this connexion. No matter how ideal the food taken in might be, unless the endocrine glands were doing their work properly, nutrition and growth would be abnormal. All the patients to be described were having normal amounts of food—usually a well-balanced diet.

He instanced first a simple and well-known example, namely, insulin deficiency. In this condition carbohydrate might be present in ample amount in the food, it was absorbed well into the blood stream, but the body could make no use of it. Dr. McDonald at this stage showed pictures of the wasted, untreated diabetic child contrasted with the child treated with insulin, who was fatter and stronger than a normal child of the same age.

Dr. McDonald next discussed the thyroid gland. He said that excess of thyroxin, as was well known, tended to reduce weight; thyrotoxic states were marked by loss of weight and the lean, wasted patient with exophthalmic goitre was familiar to all. It was not so often realized, however, that thyroid deficiency might also be associated with wasting and malnutrition, largely due to under-eating. One patient with a basal metabolic rate of -40 was actually almost four stone less than normal in weight; but his weight rose steadily when he was given six grains of thyroid extract daily. On the other hand, the patient with deficiency of thyroid was usually short and fat and of increasing weight. Slides were shown of: (a) a cretin baby, (b) an untreated adult cretin among her normal family, (c) a treated cretin—normal physically—mentally backward owing to delayed early treatment. Unfortunately, it was not always possible to treat the mental condition of the cretin with success.

Dr. McDonald said that so far the problems discussed had been comparatively simple; but now he intended to discuss that complex human factory—the pituitary. It was believed that the anterior pituitary gland produced two principles in regard to nutrition—a growth factor and a thyrotropic factor—and according to the variations of these factors many changes might be produced. Since a gonadotropic factor was also produced, many of these cases would show genital hyperplasia or hypoplasia. Slides were shown of: (a) A simple overgrowth—a child of ten years, height five feet two inches, weight 112 pounds, the size of a big fifteen year old child; it was as yet impossible to consider her sexual development. (b) A child of eight, of normal height but excessive weight, probably presenting an early Frölich's syndrome. (c) A Brissaud dwarf, a girl of twelve, of short stature, excessive weight and precocious sexual development.

Apparently in this growth factor deficiency the epiphyses did not unite until the patient had reached the age at which union normally occurred. Dr. McDonald contrasted this condition with that of the achondroplastic dwarf (slide shown) whose stunted limbs were thought to be due to too early union of the epiphyses. One of the problems in treating sex arrest with pituitary preparations was the possibility of causing dwarfism of this type by too early union of the epiphyses.

On the other hand, the growth factor might be in excess. If there were thyrotropic excess and gonadotropic lack the eunuchoid type resulted. In an adult with united epiphyses excess of growth factor would produce acromegaly.

With both growth and gonadotropic factors absent, but with the thyrotropic factor present, a small, alert dwarf resulted, the Simmond's type. Dr. McDonald showed a picture of a girl of twelve years who might furnish an example of this condition; she was backward in height and weight and sexually, but very thin and alert mentally.

Dr. McDonald said that in view of what had been said about dental development, it was notable that many of these dyspituitary children (the Frölich type especially) had large and well-formed teeth. He showed a slide illustrating perfect teeth in a dyspituitary girl (Brissaud type) of twelve years. The only tooth not sound was an incisor chipped on a bone. The diet was that of a routine relief worker.

Another gland that played a great part in nutrition was the adrenal cortex. One of the cardinal signs in Addison's

disease was wasting, while the overgrown, over-virile type was often associated with adrenal over-activity, though this might be due to a Cushing's anterior lobe syndrome. Dr. McDonald showed a slide suggesting Cushing's syndrome; the subject was a boy of eight, with hairy face, early hirsuties and precocious sexual development. No adrenal tumour nor localizing pituitary defects had yet been discerned.

Probably a glandular disturbance was responsible for the "hobbledehoy" type—the child who was said by the laity to have outgrown his strength. Dr. McDonald mentioned a boy of fourteen years who was two inches above normal height and ten pounds below normal weight, and a girl of eleven years, three inches above normal height and eight pounds below normal weight. Both were well fed and had good appetites, but were thin, tired and languid.

In conclusion, Dr. McDonald said that unless the parathyroids were working properly, no matter what calcium the food might contain, the body could make little use of it; the bones would alter and failure of growth would occur. Even though the diet were accurately balanced and controlled, no good would come of it unless the endocrine glands were working satisfactorily.

Dr. McDonald said that in order to make the cases obvious he had shown extreme examples of the conditions mentioned; but there must be many minor degrees of these disturbances, and it was necessary to remember this in the treatment of the child who refused to develop normally on a theoretically perfect diet.

Dr. N. M. GUTTERIDGE read a paper entitled: "Suggestions for Reform in Nutrition" (see page 159).

Dr. A. JEFFERIS TURNER said he had listened with interest to the addresses dealing with a subject of very great importance, and he agreed with most of what had been said. The subject was vast, and he could deal with only one or two points. He thought too much stress had been laid in the past on deficiency diseases. Scurvy cropped up occasionally and unexpectedly; beri-beri was occasionally seen in Chinese and bushmen; mild rickets was not at all rare; but all these were of very slight importance compared with the general effect on the health of partial deficiency in all the vitamins. McCarrison's investigations in India were extremely suggestive. In one of his experiments, 1,000 rats were kept under perfect sanitary conditions and given excellent diet. After two years (which was equivalent to forty or fifty years in a human being) they were killed. These rats had never suffered from disease, and the only deaths were from violence, as rats quarrelled. *Post mortem* examinations were made on these and on the rats that were killed, and no evidence of disease was found. Another 1,000 rats were given a diet consisting of white bread, margarine, tea, sugar, jam, preserved meat and scanty badly cooked vegetables. This diet was practically the same as that on which numbers of Australians lived, except that butter was substituted for margarine. There were many deaths among this group of 1,000 rats, and *post mortem* examinations showed a host of diseases of all kinds, including all sorts of disasters in pregnancy, childbirth and lactation. Dr. Turner said that it would show want of scientific caution to apply these results without reservation to human beings, but it would show much greater want of caution to contend that they had no significance.

Vitamin A was not a special growth-promoting vitamin. Animals fed on a diet excluding vitamin A showed mucous membranes which had become keratinized; also they showed inflammation, suppurative and ulceration. The animals did not grow, but it was because they could not absorb the nourishment in their food, and so died. Previously investigators had not found the reason for these deaths, as they had never looked at the mucous membranes and therefore had concluded that vitamin A was the growth-promoting factor.

Dr. J. LOCKHART GIBSON said he was very interested in the papers. He thought Dr. Marks did not lay sufficient stress on the deficiency of milk, eggs and green vegetables in the far west. There was a definite difficulty in getting

these in the far west, as they were very expensive. Many people used goat's milk, which was particularly good. Dr. Gibson thought that trachoma began with an infective conjunctivitis, possibly due to a Koch-Weekes bacillus, but if there were a predisposing vitamin deficiency it developed into trachoma. He considered that there was evidence against the infectivity of trachoma itself. He was satisfied that the history of trachoma and of its decrease in Australia supported a milk, butter, eggs and green vegetables deficiency as an important factor in its aetiology. English ophthalmologists in Egypt denied the existence of such vitamin deficiency there. Dr. Isabel Garvice, the Chief Medical Officer in the Egyptian Department of Health, confirmed Dr. Wilson's findings on ingested vitamins, but remarked to Dr. Gibson, on a recent visit to Brisbane, that ankylostoma and bilharzia were very prevalent. If that observation could be confirmed, it would mean that those parasites, by taking the blood corpuscles and blood plasma from the blood vessels, could have the same effect as an inadequate ingestion of vitamins.

Dr. PHYLIS CILENTO referred to the matters of protein spoken of by Dr. Sippe; there was a tendency to restriction of proteins, particularly by various systems of mothercraft and maternal welfare in pregnancy. One system said that no meat whatever should be taken, except under the advice of a doctor. Dr. Cilento thought that practitioners should be careful not to restrict the protein too much, particularly in the later months of pregnancy, when the child was increasing so much in weight. A committee of nutrition might assist in this matter.

A book supposed to be popular was produced by a company of biochemists and investigators in New South Wales, but had no appeal at all for women in the home, being set out in calories and kilograms *et cetera*. Pamphlets made to appeal to women should be very popular.

Dr. Cilento stated the experience of the Mothercraft Association in trying to teach mothercraft to children in the schools, was that the children assimilated facts and showed great interest in all practical matters, particularly what had to do with babies *et cetera*, but in the matter of diet the younger girls were slow to grasp the facts, though the older girls took more interest. It was difficult to arouse the interest of ordinary people in diet. In the domestic science schools the demonstrations perpetuated all the errors of diet displayed in ordinary homes. People showed no interest unless talks and demonstrations were related to things they could do in their own homes and kitchens. A diet chart was being drawn up by the Mothercraft Association, and 250 copies would be printed by the Education Department for display in the schools of the State.

Dr. E. S. MEYERS agreed that there were a lot of contradictions about the subject of the papers, and the effect of these on the public must be considered. He would like to inquire what was the relation of over-eating to the subject of atheroma. Had it any relation? Again, many of these good foods that contained the necessary vitamins were very expensive. He had never seen any resembling those on the picture shown by Dr. Gutteridge, except for export. Taking this picture as a guide, what would be the cost of feeding a family? A scheme had been put forth in England, and some of the overseas doctors were to send out photo-dietaries and lists of costs. Dr. Bourne, of Canberra, stated that vitamin C could be produced for three shillings and threepence a gramme, and a man only required 15 milligrammes daily. If these vitamins could be produced in a concentrated form, why not use them instead of the second-rate foods? The question of different types of civilization, for example, those of Eskimos, Chinese *et cetera*, and variations in the individual, also arose and had to be considered.

Dr. ALEX MURPHY thanked the writers for their papers. One very ingenious experiment had resulted in the relegation to the diagnostic scrap-heap of that old friend alcoholic neuritis. Several patients suffering from this condition were admitted to hospital, given their accustomed amount of alcohol daily, but with a balanced diet containing large amounts of vitamin B, with the result that the neuritis disappeared.

The investigations in England with regard to the part played by diet in the aetiology of rheumatism had not shed any light on the subject. The only fact which emerged was that the diet of the families in which the rheumatism occurred was lower in protein than that of non-rheumatic families. Dr. Murphy questioned the harm of a diet rich in meat, and mentioned that Australians were supposed to be large eaters of meat, and suggested that this might explain the good physique of the men of the Australian Imperial Forces, which seemed to be superior to that of most of the other troops. He was pleased to hear Dr. Earnshaw stressing the bad effects of continued sunbaking. He was satisfied from his own observations that over-exposure to the sun played a considerable part in the activation of pulmonary tuberculosis. With regard to Dr. Gutteridge's remarks on the marked increase of weight following the use of a diet containing a "proper" proportion of cereals, Mellanby had shown that a diet containing oatmeal and cereals was ricket-producing. He postulated the presence of a substance which he called a toxamin, and also pointed out that the cereals did not contain sufficient calcium and phosphorus to cope with the increased rate of growth.

PROFESSOR F. E. HELMORE, MR. H. T. HINES, DR. MONTGOMERY WHITE and MR. J. B. HENDERSON also contributed to the discussion.

Dr. Earnshaw, in reply, stated that although the complete absence of vitamin A was very rare indeed, if ever it occurred, nevertheless vitamin A probably had a more profound influence on the body than was realized. F. Hale, of the Texas Agricultural Experimental Station, reported that three litters of pigs, all deficient in eyesight, had been produced by withholding vitamin A from the mother's diet, although the diet was normal in every other respect. Two litters each contained ten eyeless pigs, whereas the other litter consisted of fourteen pigs with various combinations of eyes; some with no eyes, some with one eye, and some with one normal eye and one small eye, but all were blind. The mother of this litter had received one dose of two ounces of cod liver oil before breeding took place. The mothers of the two other litters had received no vitamin A whatever. An autopsy of the pigs that died showed that some of these pigs had only one kidney, and some had none at all.

Hess and Lewis discussed the various antirachitic agents and appraised them as follows: (i) Irradiated milk (fluid and dry), (ii) yeast milk, (iii) cod liver oil, (iv) "Viosterol", (v) irradiated yeast, and (vi) direct ultra-violet irradiation.

Dr. Sippe, in reply to remarks by Dr. Meyers on vitamins, did not mean to say that vitamins were not necessary, but that they could be obtained more cheaply by giving a well-balanced diet than by a concentrated product.

Dr. E. O. Marks, in replying to Dr. Gibson, said that goats were very prevalent throughout the west. Oranges grew freely where there was water, and there was no need to import them from the coast. At Wyandra, a small town between Charleville and Cunnamulla, there was very little trachoma; there were many orchards of very fine oranges, which were sent to Cunnamulla and Charleville. At Mitchell, where there was a butter factory, there was a lot of trachoma amongst the half-castes living in bad hygienic conditions.

Dr. S. F. McDonald agreed that there were all sorts of variations in the abnormalities shown by him; the worst trouble was that there were all sorts of in-between conditions which were only too readily attributed to diets.

Dr. Gutteridge thanked the visitors for their interesting and constructive comments. There were still some differences of opinion on nutritional matters, but a mass of evidence was accumulating which showed the important part that nutrition played in health and disease. Vitamins in the past had received more prominence than their relative position in the nutritional picture warranted.

Correspondence.

PROBLEMS OF JUNIOR RESIDENT MEDICAL OFFICERS.

SIR: "Senior", in his letter (THE MEDICAL JOURNAL OF AUSTRALIA, January 11, 1936), asks for and advocates better pay, housing, respect *et cetera*, for resident medical officers at our larger hospitals, but omits to plump for the extremely serious matter of more practical work and professional responsibility.

Many years ago I passed through the various steps from junior resident medical officer to medical superintendent of a metropolitan hospital, and on the way, during three years, was magnanimously given two appendix operations to do by the senior surgeons of that day. Most other resident medical officers of the same period gained similar experience.

Having a surgical inclination, I proceeded to hunt for work as superintendent, and only managed to get it by stealing it, by admitting urgent cases like appendices, amputations *et cetera*, under surgeons who refused to be disturbed on week-ends or during the night, and doing them myself.

The rules of the hospital, I found, said that the medical superintendent must attend to all urgent cases if the honoraries were not available.

I had to be very careful, however, because the junior honoraries and some of the seniors raised a frightful hubbub at this unseemly conduct. But two of the seniors winked the other eye, and were very kind about it. During my sojourn of five or six years at that hospital, many other resident medical officers came and went, all growling, all heartily dissatisfied with the parsimony of the senior and junior honorary surgeons in giving them no opportunity to do any major surgery.

And yet those very men who growled the loudest and schemed the hardest in their resident medical officer days to beg, borrow or steal a little practical surgery, are today among the senior honoraries of these same hospitals, and, from all accounts, more niggardly than the men they reviled so bitterly twenty-five or so years ago.

How soon and completely have they forgotten the treatment meted out to them, and their own oft and loudly voiced assertions of how differently they would act if and when the time came!

I am entirely in accord with Dr. Brodsky and "Senior" that the hospital resident medical officers should form an association and combine to insist on a better deal all round. Let us also hope that some older member of the profession will hear the call and take up and plead the cause of the junior resident medical officer, and may it be someone who has been through the mill and who sympathetically understands the rotten deal the junior resident medical officer has had for far too many years now.

Yours, etc.,

"EX SUPER."

January 11, 1936.

CLINICAL OBSERVATIONS ON BLOOD PRESSURE.

SIR: I was very interested to read in your issue of January 4 the letter from Dr. D. B. Rosenthal and Dr. H. M. L. Murray with their results of some observations on blood pressure readings in the two arms. Their findings, however, relate to a small number of patients observed over a very short period. Consequently it would be almost impossible to draw any definite conclusions, especially with regard to prognostic significance. Furthermore, their patients are a very specially selected group of individuals, namely; all sufferers from pulmonary tuberculosis, and therefore not comparable to the variety of individuals encountered in a general practice.

I am afraid Dr. Rosenthal and Dr. Murray have rather missed the point of my observations with regard to this particular type of patient.

Adverting to my paper as published in *THE MEDICAL JOURNAL OF AUSTRALIA* of October 26, they will notice:

(1) "The most frequent causes of death in the small difference group (that is a difference of less than 20 millimetres of mercury in the systolic or less than 10 millimetres of mercury in the diastolic figures for the two arms) were malignant disease, myocarditis with cardiac failure, and pulmonary tuberculosis."

(2) The cause of death in the two groups shown in Tables VIIA and VIIB shows:

(a) *Small Difference Group*.—Three out of a total of twenty-one deaths were due to pulmonary tuberculosis, and the readings were:

No. 8: 110/70 (R.), 100/70 (L.).

No. 14: 95/75 (R.), 90/70 (L.).

No. 20: 108/82 (R.), 100/72 (L.).

(b) *Large Difference Group*.—Only one out of a total of fifty deaths was due to pulmonary tuberculosis, and the readings were:

No. 30: 120/90 (R.), 92/74 (L.).

In effect, therefore, the findings of Dr. Rosenthal and Dr. Murray agree almost completely with my own records of individuals suffering from pulmonary tuberculosis.

Thanking them for the interest they have shown, and for the publications of their findings.

Yours, etc.,

ROBERT SOUTHEY.

164 Victoria Street,
North Melbourne, N.I.,
Victoria,
January 15, 1936.

Obituary.

LEILA KATHLEEN KEATINGE.

LEILA KATHLEEN KEATINGE, born on November 12, 1899, the only child of William and Ellen Keatinge, was brought up in Gippsland district of Victoria. Her father died a few months after her birth, and his twin brother had much to do in moulding her character; as he was an ardent sportsman, the child soon became an excellent horsewoman and accompanied him on duck shooting and fishing expeditions, often for many days on end.

When sent to school, at the Presentation Convent College, St. Kilda, it can well be imagined that she was classed as one of the tomboys amongst the boarders and a leader of many school pranks. At the age of eighteen, during the War years, she worked assiduously for the soldiers at home and overseas. For some time Leila Keatinge taught in schools, particularly to pupils taking French and chemistry to the higher standard.

During the disastrous influenza epidemic she worked as a voluntary nurse night and day, first in Melbourne, and then was sent as nurse in charge to Wonthaggi, where for some days she was the only woman in the improvised hospital who was not stricken with the disease and who was able to attend the patients.

At last, having gained the consent of her family, she enrolled as a medical student at Melbourne, but, disappointed with the way a certain subject was taught, she decided to transfer to Sydney. It was about this period that Leila Keatinge, with Ray Parer, in the same aeroplane that Parer and McIntosh had piloted from England, was the first woman to cross Bass Strait by air, landing on Launceston racecourse in the middle of a race meeting.

During her undergraduate career she was Year Representative on the Undergraduate Committee for four years and Women's Representative on the Medical Society Coun-

cil. In addition the Sydney University Dramatic Society cast her for important character parts in their productions, and the Sydney Repertory Theatre also made use of her love of make-believe.

Qualifying in 1925, Lithgow Hospital took her as resident medical officer, where, after twelve months of very strenuous work, she decided to sail for England, having an idea of continuing post-graduate studies in the dermatological field. After some little trouble, she secured the position of ship's surgeon on the *Port Lincoln*, the first Australian woman graduate to be given such a position. The vessel was under charter, and it was five months after leaving Australia before the ship reached England. In the meantime such out-of-the-way places as Madagascar, Cape Verde, Sicily and Crete had been visited, and memories of the sirocco and armed *gendarmes* in strange uniforms always remained.

Obtaining the Diploma in Medical Radiology and Electricity at Cambridge in 1928, she resided at Crosby Hall for some period, where between acting as *locum tenens* in East End practices, she won the International Research Scholarship given by the British Federation of University Women. Ancoats Hospital, Manchester, advertised for a radiologist to take charge of the large radiographic department for six months, and Leila Keatinge was given the position. It meant working twelve and fourteen hours a day, but this young X ray graduate fully justified her appointment. Then came some months on the Continent, particularly in Hamburg, Berlin and Paris, where interest in her new found work never flagged. An offer of an important radiological position in Shanghai was refused on account of her mother being alone in Australia.

A cable from the Sydney University Cancer Research Committee, asking for her return to assist them in the running of the newly established radiotherapy department at Saint Vincent's Hospital, brought her back to Australia.

Amongst her luggage were a number of sarcomatous rats, which to this day the captain of the ship remembers for the way they were so carefully tended and at regular and correct intervals reinoculated with the disease. It is said that on arrival, when asked by a customs officer if she had anything to declare, Leila Keatinge answered: "Rats."

Her activities from then on are more or less recorded in the pages of this and *The Journal of the Cancer Research Committee of the University of Sydney*. The work on Hodgkin's disease with Dr. L. Utz, although since found to have been commenced from wrong premises, is said by observant workers to be of definite value in the treatment of this malady.

In conjunction with Dame Constance D'Arcy, Leila Keatinge set out to improve the results obtained in cancer of the female pelvis, and the success of their efforts is to be seen in the patients attending the Saint Vincent's Hospital gynaecological clinic.

The Royal Australasian College of Surgeons asked her to report on her experiences with treatment by irradiation of malignant bone tumours, and she visited Melbourne and spent several weeks examining and gaining instruction in radon implantation. On her return, she took up this form of radiotherapy, as she did everything else, with energy and enthusiasm, tempering both with sane judgement, and a lecture given to the Committee for the Study and Treatment of Cancer disclosed the knowledge she had gained and the results obtained. She was Federal President of the women's organization known as The Open Door Council, and was the first signatory to the Articles of Association of the Australian and New Zealand Association of Radiology. She was a delegate for six years to the Australian Cancer Conference, and at those meetings she had her mind attuned to the proceedings, and raised her voice only when she had something of interest and importance to say.

At the time of her death, Leila Keatinge held the position of Honorary Radiotherapist at Saint Vincent's Hospital, Assistant Honorary Radiotherapist at Sydney Hospital (where she had trained as a student) and Consultant Radiotherapist to the Home for Incurables at Ryde.

Dr. F. P. Sandes writes:

Lella Keatinge passes into the Valley of the Shadow, to the infinite sorrow of a host of patients, medical colleagues, Sisters of Charity, hospital nurses and technical experts, with all of whom she made friends in her daily work. A month ago, in the full flower of womanhood, gowned in sombre lace, vivid with personality and glowing with life and energy, she stood before the Society for the Study and Treatment of Cancer. She told us of the latest developments of radon therapy in Australia, and I marvelled that so soon in life she had made a name for herself. For I remembered the day of her return from Cambridge a few years ago with her D.M.R.E. and a small yet precious cargo of experimental animals for the Cancer Research Committee of the University. Their excellent condition after a voyage halfway round the globe was a tribute to her love of living things, her scientific forethought, and her scrupulous attention to detail.

At that juncture the University was hard pressed to secured radiotherapists for the newly established cancer treatment clinics, and this untired young scientist was flung into the breach. Her quick perception and unfailing optimism, her sympathy with the sick, her ability to rise to emergency, and her capacity for arduous and faithful work soon brought her to the forefront in her specialty. Under her guidance the little clinic at Saint Vincent's Hospital became the meeting place of medical men and women interested in the radiation treatment of disease. Not a few of her visitors were sceptical. They would examine all things and hold fast that which was good. She put before them the records of her work and showed them the patients she had treated. They realized that the scientific enthusiasm of the young radiologist was tempered by a sober and practical turn of mind and a wealth of clinical experience. The pupil had become the teacher and, some, if not many, who came to scoff remained to pray.

In due course she entered partnership in private practice, and became Honorary Radiotherapist to Saint Vincent's and Sydney Hospitals. An avid reader, her extensive theoretical knowledge and her great practical experience were ever ungrudgingly at the service of her colleagues, whether in private consultation or at hospital or at public conferences. No doctor appealed in vain to her for help to a stricken patient, and when her own ordeal came she went to her God like a soldier—a brilliant young platoon commander in the war against malignant disease. If she sensed calamity, she showed no sign, perturbed only for her mother, regretful that she would not hear the lectures of a visiting European expert in her specialty, and yet with a last merry quip at the expense of the surgeons. In her short and strenuous life her happy spirit rendered to all full measure of kindness, and gave to her skill an even greater usefulness. Her reward shall be the loving memory of many friends.

Dr. Donald F. Finlay writes:

By the untimely death of Lella Keatinge, the scientific world of Sydney has suffered an irreparable loss, and a wide circle of friends in this city and in other lands are left to mourn her loss. She possessed that rare combination of a scientific mind with a full understanding and appreciation of the joys and sorrows of life.

Her good friend and co-scientist, Dr. F. P. Sandes, has written of her many scientific achievements, of her personality and of the meticulous detail of her work in a highly specialized branch of the medical profession. "*Mit der Dummheit kämpfen die Götter selbst vergebens.*" These words of Schiller would well express her attitude towards the particular science of her choice.

I have known Lella Keatinge for many years, and wish to speak here of other qualities which endeared her to people of all ranks and conditions of life. Her friends were legion, her bright personality and ready wit, her wide travels and broad outlook on life, brought interest to the lives of others. In her rooms one would meet, apart from medical men, visiting scientists, officers of overseas ships, merchants, journalists, artists. Such was the wide interest she took in life.

I would speak also and more particularly of her humanitarian spirit and of the altruistic motives that prompted her always in the exercise of her profession. There are a great many poor patients in this city and its environs, suffering from the most dreaded of all disease, to whom her cheerful optimism and kindly words have brought comfort and sometimes hope—hope in an otherwise hopeless world.

Such was the doctor, scientist and loyal friend who has passed, long before her time, beyond this place of wrath and tears.

"May she quiet consummation have
And renowned be her grave."

THOMAS HUGH BOYD.

THE following appreciations of the late Dr. Thomas Hugh Boyd, of Melbourne, have been received.

Dr. B. T. Zwar writes:

The passing of Thomas Hugh Boyd has removed from the midst of the medical profession in Victoria the second of two brothers who for years have made an outstanding contribution to the medical services of this State. As members of the medical staff of the Melbourne Hospital, the late W. R. and T. H. Boyd played an important part in the medical and surgical work and in the clinical teaching of that institution. This work was characterized by an extraordinary devotion to duty, soundness of judgement and a desire and ability to keep abreast of the many developments in the various fields of medicine and surgery. Outside their public hospital work these two brothers established a general medical and surgical practice which set a very high standard of efficiency and thoroughness. In its establishment, their association with Bethesda, the Salvation Army Hospital, in Richmond, was of immeasurable value, whilst on the other hand the management of that institution, the medical profession and the sick poor of Victoria are under an incalculable debt of gratitude for their wise counsel and influence in its guidance. During the greater part of his professional career the work of T. H. Boyd was indissolubly associated with that of his brother, and, as already indicated, the two established and maintained an extraordinarily efficient unit of service.

In order to fit himself for the surgical part of this work, T. H. Boyd, after the year's residentship at the Melbourne Hospital which followed his graduation, left for England in May, 1892, in order to undergo further post-graduate training in surgery. He obtained the F.R.C.S. (England) in 1894, and returned to Australia early in 1895 and joined his brother in his practice in Richmond.

As a surgeon, T. H. Boyd's work was characterized by extraordinary soundness of judgement and by surgical skill. His judgement in turn depended on the thoroughness of his methods of investigation, in the conduct of which, if necessary, he was ever ready to avail himself of the assistance of his brother or of some other physician or specialist of standing. In all his work, T. H. Boyd was never a "showman"; he disliked any semblance of this, and was always modest about his own achievements.

With a shrewd and critical mind, Boyd had a kind and very loyal heart, and would make nothing of a service to a cause or a friend that cost him much time, thought and money. It is small wonder then that he was highly esteemed and respected both by his colleagues and his patients, and all those who had the privilege of knowing him will share in the sorrow which his death has caused.

Dr. Konrad Hiller writes:

With the death of Dr. T. H. Boyd the third of the triumvirate which did so much to establish the first intermediate hospital in Melbourne, Bethesda, has gone. Andrew Honman and W. R. Boyd had probably the greater share in its success, but T. H. Boyd seconded those efforts to his fullest capacity. Conveniently situated to his own large practice, his private surgical work was performed

almost exclusively at that hospital, where he was beloved and respected by all who came in contact with him, and it was fitting that his body should be carried past the scene of so many years of his work, and that the nurses be given the opportunity of paying their last tribute to his passing.

For many years he was Honorary Surgeon to the Royal Melbourne Hospital, where he served in an out-patient and in-patient capacity, and on his retirement was elected an Honorary Consulting Surgeon. Unostentatiously he did there an enormous amount of valuable work with the conscientiousness and thoroughness which were characteristic of him. For some time he corresponded with me, and it was then that I got to know him. He was a few years my senior, and at first I was led to believe from his appearance that he was stern and perhaps cynical, but his looks belied the man. There was no kinder heart or more sympathetic nature than Tom Boyd's. One need only to have seen him every Christmas day visiting his gaily decorated wards to realize how human he was. By his death many a home has lost a faithful doctor and a trusted friend. His work was his hobby. When he allowed himself some respite it was usually spent at Peterborough, whose quiet pursuits appealed to him.

With the death of his brother eighteen months ago, his practice grew beyond what he could carry, and he decided to retire into private life. It was whilst he was engaged in handing over his burdens to his successor that his last illness overtook him.

The heartfelt sympathy of his friends goes out to his relatives and sorrowing wife.

Matron McGregor writes:

Right from the foundation of the Bethesda Hospital in 1904, the late Mr. T. H. Boyd, together with his brother, the late Dr. W. R. Boyd, displayed the keenest interest in all activities, and they came to be regarded by the management and the nursing staff as part of the institutional life. With their homes in that vicinity, it was no unusual thing to see both "Mr. T. H." and "Dr. W. R." (as they were affectionately known at the hospital) at all hours of the day or night.

The two brothers seemed to work in splendidly together, and the passing of Dr. W. R. in about the end of 1933 was a severe blow to Mr. T. H. Mr. T. H. was always an unselfish kind, and the keen interest shown in many practical ways acted as a stimulus and helped to maintain the high efficiency of the hospital. The X ray and pathological departments originated mainly through the efforts of the two brothers, who by keeping in touch with all the latest developments, had much to do with the high standard they have reached today.

At Christmas time and on other festive occasions, Mr. T. H. always took the keenest interest in the decorative and other arrangements, and it always seemed the greatest pleasure to him to help to provide at these happy times. His unflinching spirit of kindness was evidenced in many ways, despite the habitual reserve of his manner, and the poor of Richmond and district will greatly miss his many kindly acts.

We all felt it was a privilege to be associated with him, and his methods were such as called forth our very best efforts and made us take a pride in doing our work in the most efficient way possible.

The passing of Mr. T. H. Boyd closes an association with the Bethesda Hospital covering three decades.

LEONARD REDMOND.

DR. LEONARD REDMOND, whose death occurred recently at Charters Towers, Queensland, was born in December, 1854, at Annaghmore, County Armagh, Ireland. He was one of a family of eleven, three of whom entered the medical profession. He studied medicine at Queen's College, Belfast, and graduated as Bachelor of Medicine. In 1884 he was admitted to the degree of Doctor of Medicine of the Royal University of Ireland. He visited America,

England and the Continent of Europe for post-graduate study. Dengue fever was one of the diseases that he studied most assiduously.

Leonard Redmond was a courteous and careful practitioner; he was devoted to his patients' welfare, and they held him in high regard. He had the typical Irish temperament and always spoke his mind without hesitation. He will be missed in northern Queensland, where he practised for so many years. He is survived by his wife, three sons and a daughter.

EDWIN MOULSEY GOARD.

WE regret to announce the death of Dr. Edwin Moulsey Goard, which occurred on January 21, 1936, at Sydney, New South Wales.

Analytical Department.

"DEXSAL."

"DEXSAL" is stated by the manufacturers, Felton, Grimwade and Duerdins, Limited, of Melbourne, to be an effervescent preparation of medicinal glucose. It is said to contain 34% of glucose. A sample has been submitted to analysis by our analysts, who find that it contains 33.6% reducing sugars as dextrose (d-glucose). This result confirms the claim made by the manufacturers. "Dexsal" may be regarded as a suitable preparation in which the use of glucose is indicated.

Books Received.

CATECHISM SERIES: ANATOMY (HEAD AND NECK); Fourth Edition; Part III; 1935. Edinburgh: E. and S. Livingstone. Crown 8vo, pp. 80.

A MANUAL OF PRACTICAL CHEMISTRY FOR PUBLIC HEALTH STUDENTS, ESPECIALLY ARRANGED FOR THOSE STUDYING FOR THE D.P.H., by A. W. Stewart, D.Sc., A.I.C.; Third Edition; 1935. London: John Bale, Sons and Danielsson. Crown 8vo, pp. 121, with illustrations. Price: 7s. 6d. net.

TUMOURS OF THE URINARY BLADDER, by H. Beer, M.D., F.A.C.S.; 1935. London: Baillière, Tindall and Cox. Royal 8vo, pp. 173, with 52 illustrations. Price: 16s. net.

ANNALI DELLA CLINICA DELLE MALATTIE NERVOS E MENTALI DELLA R. UNIVERSITA DI PALERMO, Volume VI, 1934-35; edited by R. Colella; 1935. Palermo: Industrie Riunite Editoriali Siciliane. Demy 4to.

CLINICAL TUBERCULOSIS, by various authors; edited by B. Goldberg, M.D., F.A.C.P., F.A.P.H.A., Volumes I and II; 1935. Philadelphia: F. A. Davis Company. Super royal 8vo, fully illustrated with over 640 half-tone and line engravings and nine full-page colour plates. Price: \$22.00 net.

DISEASES OF WOMEN, by H. S. Crossen, M.D., F.A.C.S., and R. J. Crossen, M.D.; Eighth Edition, entirely revised and reset; 1935. St. Louis: The C. V. Mosby Company. Super royal 8vo, pp. 1003, with 1053 illustrations. Price: \$10.00 net.

AGGRESSIVE MEDICINE, by J. Maberly, M.R.C.S., L.R.C.P.; 1935. London: Baillière, Tindall and Cox. Demy 8vo, pp. 240. Price: 10s. 6d. net.

MOEURS ET PROSTITUTION, by M. Rogeat; 1935. Paris: Nouvelles Editions Latines. Demy 8vo, pp. 352. Price: 10 francs net.

THE PATIENT AND THE WEATHER, by W. F. Petersen, M.D.; Volume I, Part 1: The Footprint of Asclepius; 1935. Ann Arbor: Edwards Brothers. Demy 4to, pp. 127, with illustrations. Price: \$3.75 net.

COMMON SKIN DISEASES, by A. C. Roxburgh, M.A., M.D., B.Ch., F.R.C.P.; Third Edition; 1936. London: H. K. Lewis and Company, Limited. Demy 8vo, pp. 419, with illustrations. Price: 15s. net.

HEALTH AND HUMAN PROGRESS: AN ESSAY IN SOCIOLOGICAL MEDICINE, by R. Sand, with preface by E. Herriot; 1935. London: Kegan Paul, Trench, Trubner and Company, Limited. Demy 8vo, pp. 388. Price: 10s. 6d. net.

RECENT ADVANCES IN CARDIOLOGY, by T. East, M.A., D.M., F.R.C.P., and C. Bain, D.M., M.R.C.P.; Third Edition; 1935. London: J. and A. Churchill Limited. Demy 8vo, pp. 361, with illustrations. Price: 12s. 6d. net.

ESSENTIALS OF CARDIOGRAPHY, by H. B. Russell, M.D., M.R.C.P.; 1935. London: J. and A. Churchill Limited. Demy 8vo, pp. 88, with illustrations. Price: 7s. 6d. net.

THE PRINCIPLES AND PRACTICE OF X-RAY THERAPY, by F. Roberts, M.A., M.D., M.R.C.P., D.M.R.E.; 1935. London: H. K. Lewis and Company, Limited. Demy 8vo, pp. 225, with 115 illustrations. Price: 10s. 6d. net.

THE PARATHYROIDS IN HEALTH AND IN DISEASE, by D. H. Shelling, B.Sc., M.D.; 1935. St. Louis: The C. V. Mosby Company. Super royal 8vo, pp. 335, with illustrations. Price: \$5.00 net.

INFANT NUTRITION: A TEXTBOOK OF INFANT FEEDING FOR STUDENTS AND PRACTITIONERS OF MEDICINE, by W. McK. Marriott, B.S., M.D.; Second Edition; 1935. St. Louis: The C. V. Mosby Company. Royal 8vo, pp. 431. Price: \$4.50 net.

LETTERS FROM ROME: AN AUSTRALIAN'S VIEW OF THE ITALO-ABYSSINIAN QUESTION, by H. M. Moran, M.B., Ch.M., F.R.C.S., F.A.C.S.; 1935. Australia: Angus and Robertson Limited. Demy 8vo, pp. 54. Price: 1s. net.

VITAMINS IN THEORY AND PRACTICE, by L. J. Harris, Sc.D., D.Sc.; 1935. Cambridge: The University Press. Melbourne: S. Jaboor. Demy 8vo, pp. 259, with illustrations. Price: 8s. 6d. net.

Diary for the Month.

- FEB. 4.—New South Wales Branch, B.M.A.: Organization and Science Committee.
 FEB. 5.—Western Australian Branch, B.M.A.: Council.
 FEB. 6.—Victorian Branch, B.M.A.: Branch.
 FEB. 6.—South Australian Branch, B.M.A.: Council.
 FEB. 7.—Queensland Branch, B.M.A.: Branch.
 FEB. 11.—New South Wales Branch, B.M.A.: Executive and Science Committee.
 FEB. 14.—Queensland Branch, B.M.A.: Council.
 FEB. 18.—New South Wales Branch, B.M.A.: Ethics Committee.
 FEB. 19.—Western Australian Branch, B.M.A.: Branch.
 FEB. 25.—New South Wales Branch, B.M.A.: Medical Politics Committee.
 FEB. 26.—Victorian Branch, B.M.A.: Council.
 FEB. 27.—South Australian Branch, B.M.A.: Branch.
 FEB. 28.—Queensland Branch, B.M.A.: Council.

Medical Appointments.

Dr. M. A. Smith and Dr. B. Fife have been appointed Resident Medical Officers at the Adelaide Hospital, South Australia.

Dr. J. H. Halliday has been appointed a member of the Boards of Official Visitors to the Mental Hospitals at Parramatta and Rydalmere, New South Wales.

Dr. T. H. Goddard has been appointed an Official Visitor to the Mental Hospital, New Norfolk, Tasmania.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser", pages xx, xxi, xxii.

COLLINSVILLE DISTRICT HOSPITAL, COLLINSVILLE, NORTH QUEENSLAND: Medical Officer.

MILDURA BASE HOSPITAL, MILDURA, VICTORIA: Resident Medical Officer.

SAINT VINCENT'S HOSPITAL, SYDNEY, NEW SOUTH WALES: Honorary Officers.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCHES.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmalm United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phoenix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Brisbane Associate Friendly Societies' Medical Institute. Chillagoe Hospital. Richmond District Hospital, North Queensland. Members accepting LODGE appointment and those desiring to accept appointments to any COUNTRY Hospital, are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	All Lodge appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 205, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (Wellington Division): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Editorial Notices.

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